www.WhitakerBrothers.com

850,1200, 1500, 2000
Medium Duty Single Shaft Shredder

Models Covered:
AMS, CMS, SMS, ESS, MMS

Part Number: MAN-EPS-0001
Bulletin Number: GRN4-605
Effective: August 1, 2012

an ACS Group company

Write Down Your Serial Numbers Here For Future Reference:

_____ _____

_____ _____

_____ _____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____
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Shipping Info

Unpacking and Inspection

You should inspect your equipment for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. You should have:

- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the shipping department immediately**. For immediate assistance, please contact the correct facility located in the technical assistance section of this manual. Have the order number and item number available. *Hold the items until you receive shipping instructions*.

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Credit Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from **the manufacturer** returned is subject to 15% ($75.00 minimum) restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given at **the manufacturer's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company**,** purchased components are covered under their specific warranty terms.

Storage, Disposal, Transportation

Storage

Clean the machine (see “Cleaning the Machine”). Preserve all polished metal surfaces using a suitable rust preventing agent. Store the machine in a dry, enclosed space. Cover the machine completely with a plastic sheet.

Disposal

The disposal of machines, machine components, and process materials is partially subject to legal controls. More detailed information is given at the relevant administrative authority (i.e. regional and national Water Conservation Bureau and Environmental Protection Agencies). Only deposit the material to be disposed of at authorized drop-off points.

Transportation

⚠WARNING

Suspended load!

- ***Falling loads can cause serious injury or death. Only use a crane or forklift that can withstand the weight and dimension of the load!***
- ***Use suitable stopping means and pay attention to gravity center location!***
- ***Do NOT step under the suspended load!***
- ***Wear protective helmet in addition to basic protective gear!***

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Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your equipment. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the equipment. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the equipment. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the equipment safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your equipment provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. A spare parts list with part numbers specific to your machine is provided with your shipping paperwork package. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

⚠ DANGER

DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.

Figure 1: Safety Tags and warning features

Hazard Alert Symbol	Description/Explanation	Preventative Maintenance
	High Voltage Hazard. The electrical enclosure is supplied with 3-phase electrical power. Use caution when using or maintaining this product.	Every six months inspect all electrical connections for secure attachment. For further information see the Maintenance Chapter in this manual
	Hands could be exposed to a crushing movement.	Every month inspect the shears/blades for any type of wear. For further information see the Maintenance Chapter in this manual
	When equipped with belts and sheaves, hands could become entangled.	Every month inspect the belt(s) for any type of wear. For further information see the Maintenance Chapter in this manual.
	Hands can become entangled or cut if they enter the danger zone of gears or cutting shears.	Every month inspect the shears/blades for any type of wear. For further information see the Maintenance Chapter in this manual.
	The unit can produce continuous noise above 85 dBA and/or produce projectiles under normal operating conditions.	Always wear eye and ear protection when the machine is in operation or performing maintenance.
	A person could be exposed to a crushing movement if walking around or under machine that is open/suspended for moving.	Always be aware of your surroundings and do not walk underneath a suspended machine.

Mandatory Symbol	Description/Explanation
	Read Operators Manual. This equipment must be operated and maintained by properly trained personnel. The information contained within this manual must be read and understood prior to operating this equipment.
	Lock Out. This equipment is operated with 3-phase electrical power. Therefore, when performing any maintenance operations we recommend following the local standards for performing a lock-out/tag-out procedure.
	Wear Safety Gloves. This equipment operates with sharp blades and rotors. We recommend that technicians use safety gloves while performing maintenance to protect hands from being exposed to these sharp surfaces.
	Wear ear and eye protection. This unit may produce loud and continuous noise and may produce projectiles.
	Pneumatic or hydraulic equipment. Pneumatic or hydraulic equipment must be kept at a safe pressure.
	Do not reach into unit. Reaching into a unit is prohibited while the unit is in operation and may cause serious injury.

1-2 General Safety Regulations

This machine uses cutters for the performance of its intended use. Consequently, it can be a dangerous machine to operate and maintain unless these safety regulations are followed.

These regulations should be read, understood and periodically reviewed by all personnel involved in any way with this machine.

Never operate or remove any machine components that are secured by wrench-type fasteners unless the motor is electrically locked out and the rotor is motionless.

Never operate the machine or jog the rotor unless the cutting chamber covers, discharge chute, or any guards or covers are in place and secure. Do not circumvent the safety interlocks.

Prior to clearing a jam or performing any maintenance, the motor should be turned off and electrically locked out. Be sure that the rotor has come to a stop. Hands must not be inserted into the machine to clear the jam.

Do not extend any part of the body into feed roll openings or discharge area unless the motors are electrically locked out and the rotor and feed rolls are motionless.

Never extend fingers through holes in screen.

Be sure that the v-belts are properly aligned and that tension is at its maximum.

Extreme care should be taken to see that all screws are properly tightened at all times. During the operation of the machine, rotor cutter screws may come loose. Although fine threads are used on the rotor cutter screws because vibration does not easily loosen them, you should inspect the tightness of the screws frequently.

This machine is designed for the granulation of plastic materials. Do not feed any other materials into the machine.

1-3 Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Becoming familiar with materials, inspection, speed limitations, screens, and guard maintenance and total user responsibility will assist you in learning potential areas in need of observation for danger.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All caution, warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

1-4 Warnings and Precautions

⚠WARNING

Our granulators are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this granulator, use good judgment and follow these safe practices:

- ☑ **LEARN AND OBEY** your company's safety policy regarding granulating equipment.
- ☑ **MOVING OR LIFTING THE GRANULATOR:** Although our equipment is built and engineered for great ruggedness in operation, care must be taken when moving the machine along the floor or lifting it. Damage may occur to sheet metal covers, electrical cabinets, or small brackets if pressure is applied to them when moving the granulator. When lifting the granulator, be certain of total machine weight and the capability of the lifting equipment. (See the Granulator Specification Sheets for machine weights and dimensions.)
- ☑ **SHREDDER LOCATION:** Adequate area for routine maintenance should be provided in order to open the machine for cutter, screen, or cleanout service. Proper service area clearances also should allow people who are working on the machine to be clearly visible to others, thereby reducing the potential safety hazards.
- ☑ **SAFE HOUSEKEEPING:** The work area must be kept clean and uncluttered during periods of operation or maintenance. No hand tools or other metal objects should be left on or around the machine. Any tools or other metal objects that mistakenly fall into the hopper feed opening can cause severe damage to internal cutting chamber, rotor and screen components.

- ☑ **SAFETY GLASSES OR A FACE SHIELD MUST ALWAYS BE WORN** when servicing or operating the machine. Although our machines are designed for the maximum in flyback control, caution must be used when operating near the hopper feed opening in order to guard against unexpected material flyback.

- ☑ **EAR PROTECTION** may be required when operating the machine during granulation of very hard or noisy materials. The Occupational Safety and Health Act of 1970 has established guidelines for Permissible Noise Exposures (OSHA 1910.95) that should be followed.
- ☑ **NEVER** attempt to operate the machine unless it is fully assembled with all guards and interlocks in place and functional.
- ☑ **OBSERVE** all danger, warning, caution and safety labels on the equipment.
- ☑ Upon completion of any machine maintenance, be certain **ALL SAFETY GUARDS AND COVERS** are securely and properly fastened prior to resuming machine operation. All fasteners must be in place and properly tightened. **ANY SHORTCUTS MAY RESULT IN INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT.**
- ☑ **NEVER** wear any loose fitting clothes, neckties, or dangling items such as earrings, belts, or shoestrings. Jewelry, such as wristwatches, bracelets, or rings should NEVER be worn. Long hair must be tied back or placed in a tight fitting hairnet. NEVER lean against or rest hands or feet on the granulator when it is in operation or open for maintenance. NEVER stand on the granulator when it is in operation.

- ☑ **ROTATION OF MOTORS:** The correct rotating direction for the machine motor is clearly marked on the machine. Always check for proper rotation of motors. Incorrect rotation direction can cause severe damage.
- ☑ **ELECTRICAL GROUNDING:** All electrical equipment on the granulator must be grounded in accordance to all local codes and Article 250 of the National Electric Code.
- ☑ **ALWAYS DISCONNECT AND LOCKOUT** the main electrical power to the granulator before performing any service.
- ☑ **SAFETY INTERLOCKS MUST NOT BE BYPASSED.** The mechanical and electrical safety interlocks ensure the safety of personnel. They should never be tampered with or removed for ANY reason. They should be checked frequently by a qualified mechanic for proper operation.
- ☑ **NEVER** modify the machine configuration or any individual component without written notice from the factory.

Remaining Risks

The machine is constructed so that you are able to operate it safely. Structurally non-avoidable dangers are prevented as well as possible by the protective devices. Certain risks still remain. It is imperative to be aware of these risks in order to avoid accidents. To avoid danger, please observe all safety advice provided.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Danger of crushing by heavy parts falling down/over	Unloading and transporting the machine and/or components	Serious injury	• Wear personal protective gear • Follow safety instructions in manual
Cutting caused by sharp cutters—even when rotor is stationary	Cutter replacement, cutter setting, cutter sharpening and other maintenance work	Serious injury particularly to hands and fingers	• Wear personal protective gear • Follow safety instructions in manual
Crushing when opening/closing maintenance doors on front side of machine	Maintenance work	Serious injury	• Make sure no persons are in the danger area while closing the door
Tripping over cables and other objects	All activities	Serious injury	• Lay cables in accordance with regulations. • Keep work station clean and tidy.
Crushing, cutting, amputation caused by run down of the rotor	Maintenance work	Serious injury or death	• Maintenance doors must always be tightly locked during operation. • DO NOT make the run down safety devices ineffective by using technical aids or other manipulations. • NEVER use hands to check if the rotor has stopped.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Pulling in caused by running V-belts	All activities	Serious injury can result from hair, jewelry, etc. being pulled into the machine.	• Never dismount V-belt protection and window.
Direct/indirect contact with live parts in terminal box.	Maintenance work, start up	Serious injury or death	• Only trained electricians may carry out all work on the electrical equipment. If work is necessary on parts that conduct dangerous voltage, a second person should be present to break the power supply in case of emergency. • The yellow-marked lines conduct voltage at all times—even when the machine is switched off. • Only use original safety fuses with stipulated intensity of current. • Faulty electrical components must be replaced immediately. • If faults occur in the electrical energy supply, switch machine off immediately. • The terminal box must be locked during operation. Before opening the terminal box switch too off (“O”).
Failure of Emergency Stop function	All activities	Serious injury or death	• It must be guaranteed that failure of an Emergency Stop button is displayed and leads to an immediate stop.
Fire/explosion caused by throwing dangerous objects (i.e. spray cans) into the shredder	Grinding	Serious injury or death	• Only grind material which corresponds to the agreed customer-specific specifications in all points.
Damage to hearing	All activities	Diminished hearing, headaches, impaired balance, deterioration of concentration	• Reduce noise emissions by taking suitable measures. • Wear ear protection.
Instability of machine caused by vibration	All activities	Serious injury	• Install the machine according to the instructions in the manual.
Loosening of the cutting cutter mountings caused by vibration	All activities	Serious injury	• Check the cutting cutter mountings regularly according to the instructions in the manual.
Inhalation of grinding dust	All activities	Diseases of the respiratory tract, etc.	• Mount a suitable air suction device and wear breathing equipment if necessary. • When cleaning the machine, use suction; do not blow out grinding dust.

Type of Danger	Activity	Possible Consequences	Preventative Measures
Crushing, cutting, amputation caused by manipulation of protective devices	All activities	Serious injury or death	• Never make the protective devices ineffective. • Check the protective devices regularly for proper function according to the manual's specifications.

For further information on granulator safety, installation and operation, see the *American National Standard for Plastics Machinery—Granulators, Pelletizers, and Dicers Used for Size Reduction of Plastics—Construction, Care, and Use*. ANSI B151.11-1982.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

This manual covers the 850, 1200, 1500 and 2000 Medium Duty Single Shaft Shredders, which include models AMS, CMS, SLS, ESS and MMS.

The Medium Duty Single Shaft Shredder Series is designed for processing scrap from wood industries—miscellaneous trim and panel scraps, furniture, injection and extrusion mold start-up purge, heavy wall parts, paper and cardboard, and film (baled and loose).

2-2 General Description

Mechanical Section

After the machine has been switched ON, a hydraulically controlled "swing-style" ram pushes a quantity of material onto the slow-running profiled rotor. The in-feed is controlled according to load.

The material can be placed (unsorted) in the hopper mounted on top of the machine. Pay attention to this material; it cannot contain **any other metal parts** except for staples and nails. (The guarantee does not cover any damage to the machine as a result of metal parts being fed into the machine.) The cutters on the rotor shred the material in the hopper. This shredding process is repeated as often as required until the whole diameter of the screen below the rotor has been reached.

The shredder can also be switched off with material still in the hopper.

Control

The machine is fitted with an automatic shutdown; i.e. when set to automatic, the machine switches off after a pre-set period in the time relay.

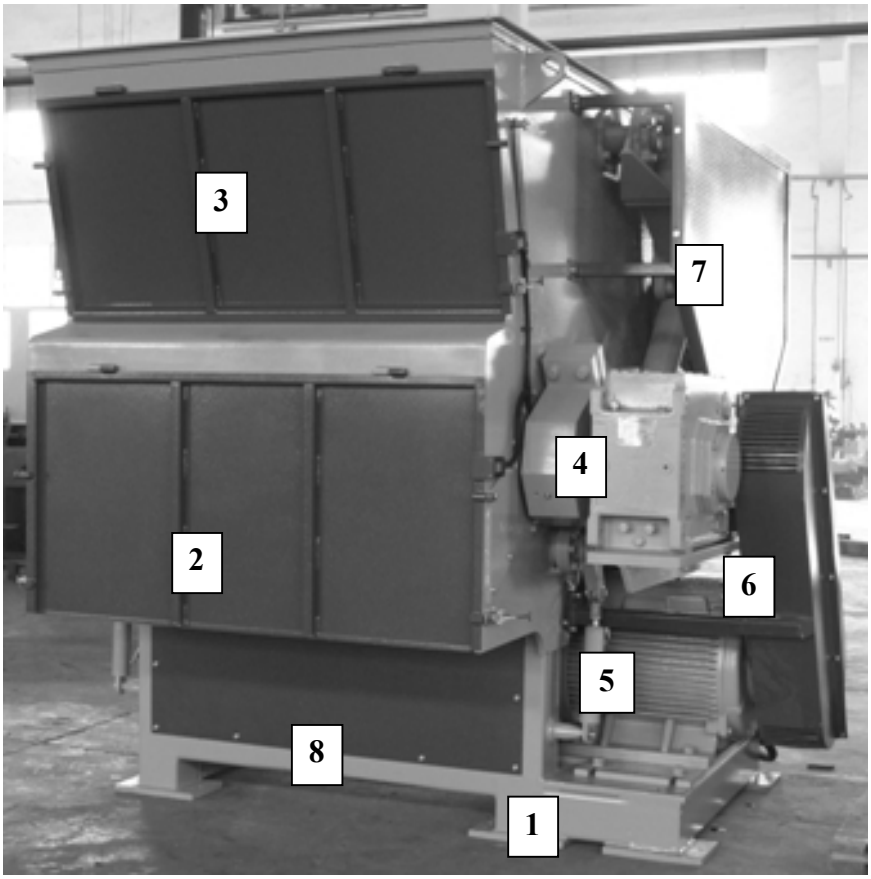
The ram feeds the shredding unit (rotor) with as much material as it is able to process. Upon reaching 70 to 90 % of rated current, the feeding of the ram will be stopped and automatically started again after the power consumption has fallen by 20% in comparison with rated current. If the high current is applied longer than 0.7 - 1.5 seconds, the main drive motor switches off and runs back after about 3 seconds standstill time. The ram plate also runs back while the rotor runs back. The drive motor then stops for another 3 seconds before starting again.

Duration of pauses and return and current settings can be adjusted.

NOTE: Any alterations should only be carried out after consulting the manufacturer.

Machine (Standard Execution)

(1) Base Frame
(2) Machine door
(3) Hopper door
(4) Gear Box
(5) Drive motor
(6) V-belt guards
(7) Ram hydraulic guards
(8) Discharge area



The machine housing, drive motor, gear box, hydraulic system and terminal box are mounted on the base frame for electrical connections.

2-3 Typical Features and Components

Material In-feed

The material can be fed into the shredder in the following ways:

- Manual in-feed of the material directly into the in-feed hopper.
- Manual in-feed of the material with the help of an additional in-feed device (e.g. hydraulic feeding unit).
- Automatic in-feed of the grinding material via an additional in-feed device (i.e. conveyor belt).

In-feed Hopper

The material in-feed flows through an in-feed hopper to ensure the grinding material is delivered safely and correctly.

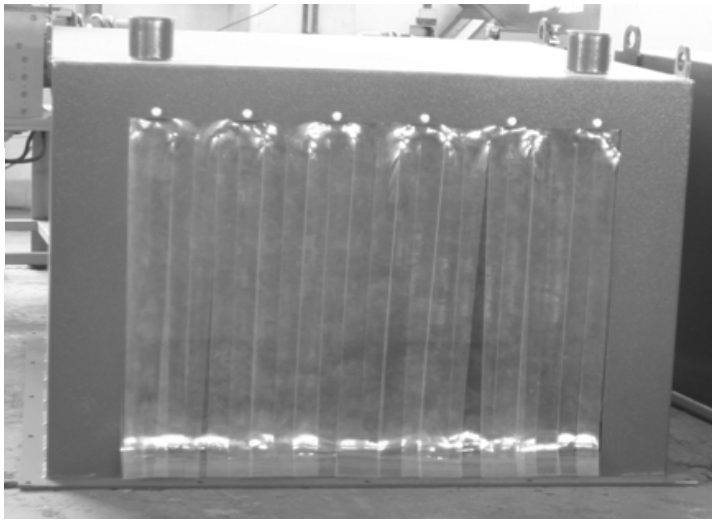
NOTE: An optional top-hinged cover to prevent in-feed material fly-back during size reduction is available.

Special hopper with hydraulic cover

Additional In-feed Device

If the machine has an optional in-feed device such as a conveyor belt, please refer to the additional information about the accessory in the manufacturer's manual that accompanied the accessory. A special hopper for an in-feed with conveyor arrangement can be supplied as an option to the standard hopper.

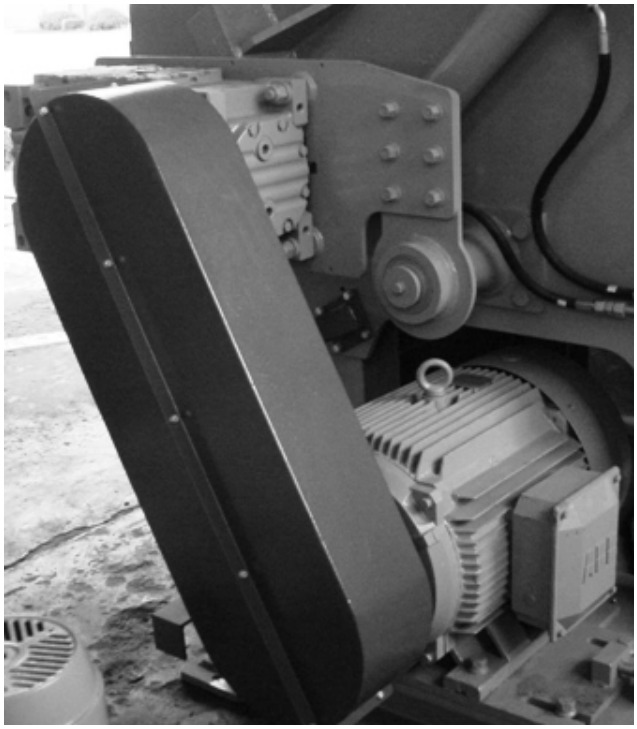
Hopper for conveyor belt in-feed



Drive

The drive of the rotor runs using an electric motor via V-belts. The motor (mounted on sliding rails or a motor plate) can be adjusted for regulating the tension of the V-belts using tensioning screws. The V-belt pulley is attached to the motor shaft with a special tensioning element.

Drive motor



NOTE: Please observe the operation manual from the manufacturer!

Rotor, Cutters, Bed Cutters

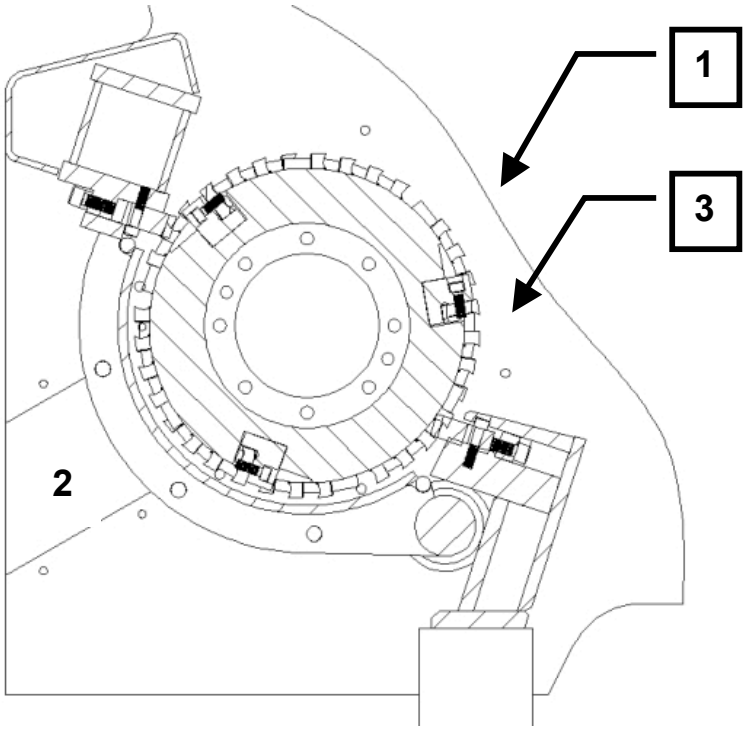
Rotor, cutters, bed cutters

- The material is shredded between the cutters assembled on the rotor and the bed cutters; they are mounted in a fixed position in the machine lower section.
- All rotors are equipped with square cutters. These cutters make light work of the heaviest pieces.

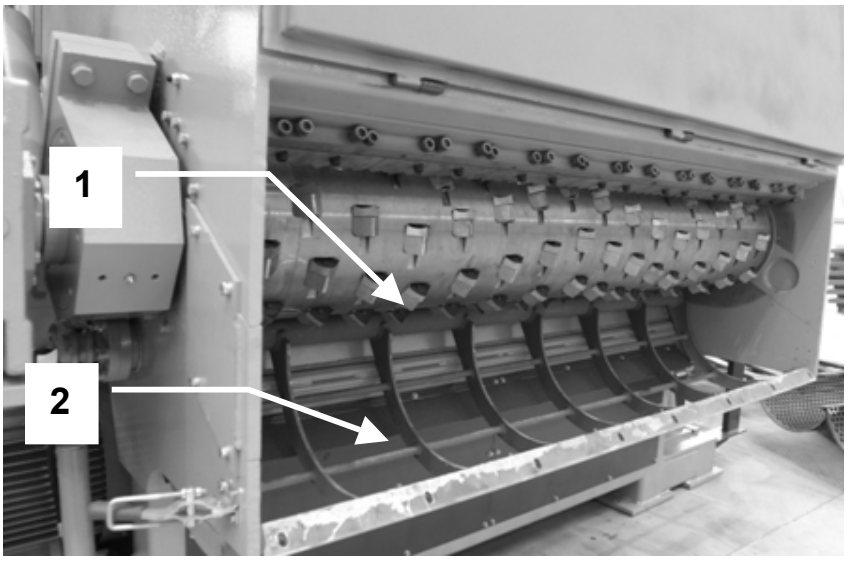
NOTE: The cutters have four corners so they can be easily turned once a corner has worn out.

- The design of the rotor has a significant influence on the quality of the shredding process and the results. The rotor construction, the type of cutter mounting and the number of cutters have been matched to the application.

(1) Rotor cutter
(2) Screen support (hydraulic)
(3) Bed cutter



(1) Rotor cutter
(2) Screen support

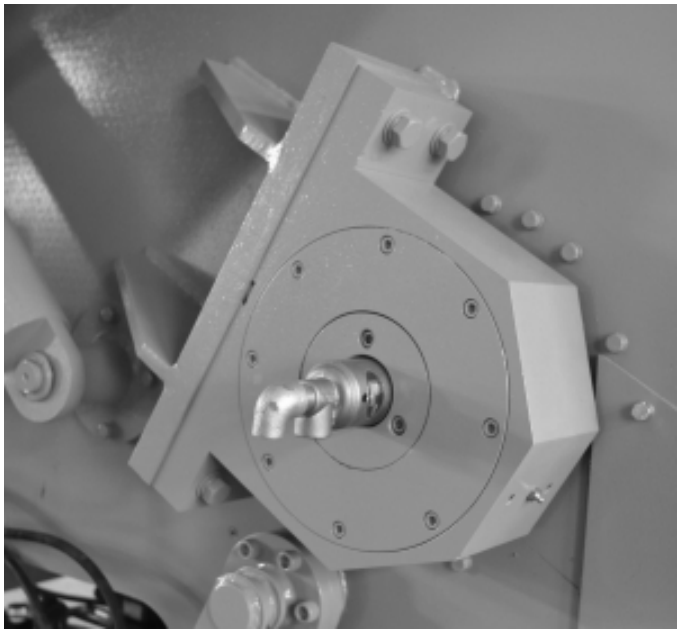


The rotor is accessible after opening the machine door and removing the screen.

The rotor is arranged on roller bearings that situated outside the housing. The V-belt pulley is attached to the rotor axis with a taper brush. The rotor is dynamically counter-balanced and has vibration-free concentricity.

An optional feature is a water-cooling system for the rotor used for special applications.

Bearing with water plug for rotor cooling

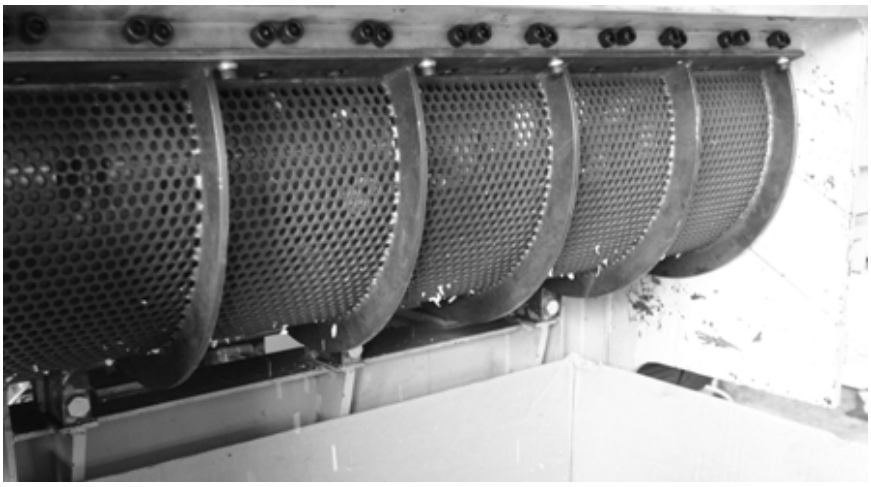


Screen and screen support

The screen and the screen support are welded together and fixed to the housing by screws in the standard execution.

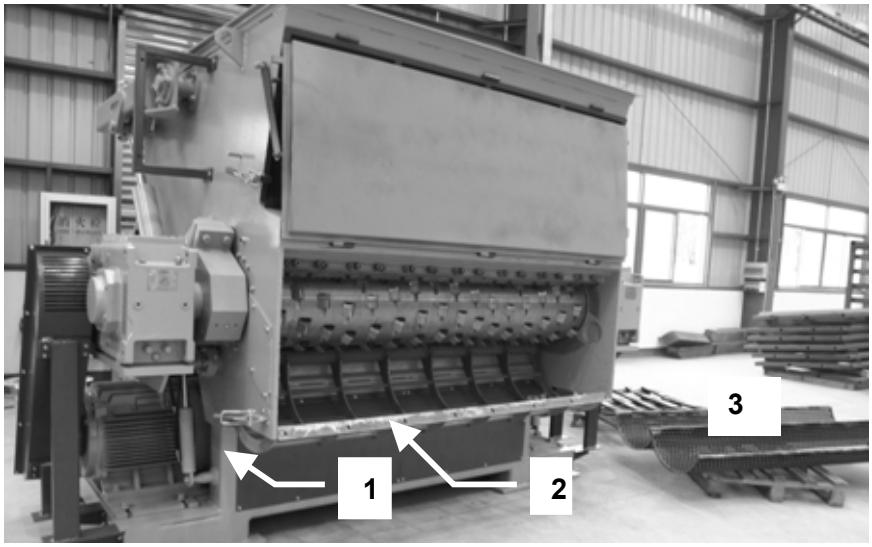
The screen is slightly larger in radius than the cutting circle of the rotor cutters. The screen perforation is selected according to the desired grain size of the grinding material. All shredding material parts which are smaller than the screen perforation fall through the screen. The screen is replaceable and can be taken out after opening the machine door.

Standard screen



Another optional feature is a screen support that can be lowered by a hydraulic system.

(1) Hydraulic cylinder
(2) Screen support
(3) Screen



Discharge of Shredding Material

Normally the shredded material will be discharged onto a conveyor belt. (Options include a discharge with blower or with a screw conveyor.)

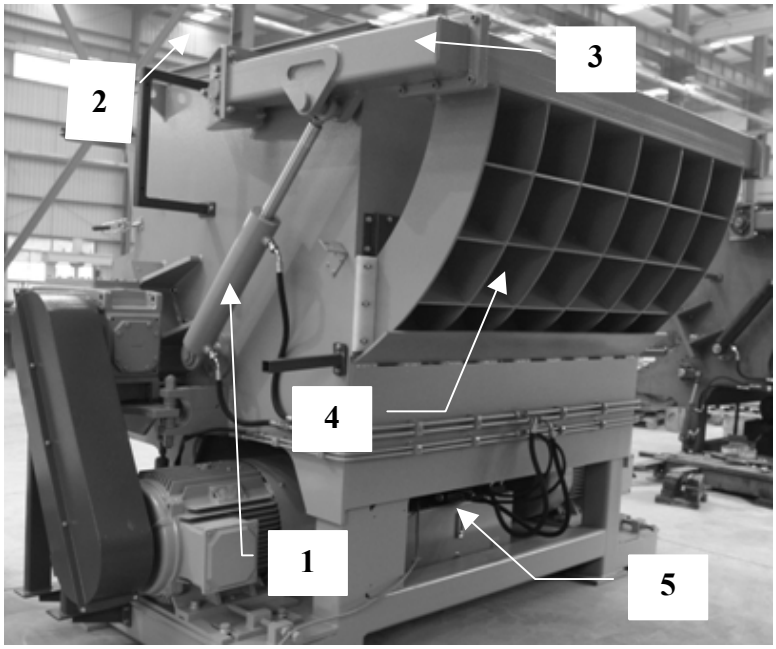
Discharge with conveyor

Hydraulic Ram

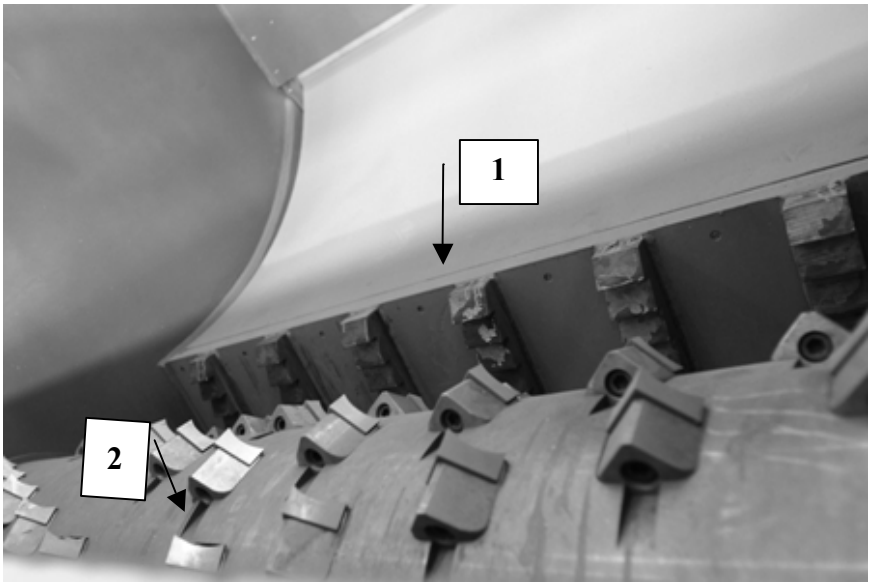
The hydraulic ram is fixed on two arms arranged on flange bearings. Two heavy-duty hydraulic cylinders move the ram back and forth. The ram moves automatically after switching ON the hydraulic system and the shredder when the machine is operated in automatic mode.

NOTE: The ram can be moved by hand on the control panel when run in manual mode.

(1) Hydraulic cylinder
(2) Flange bearing
(3) Ram arm
(4) Ram
(5) Hydraulic unit



(1) Serrated ram front plate
(2) Rotor



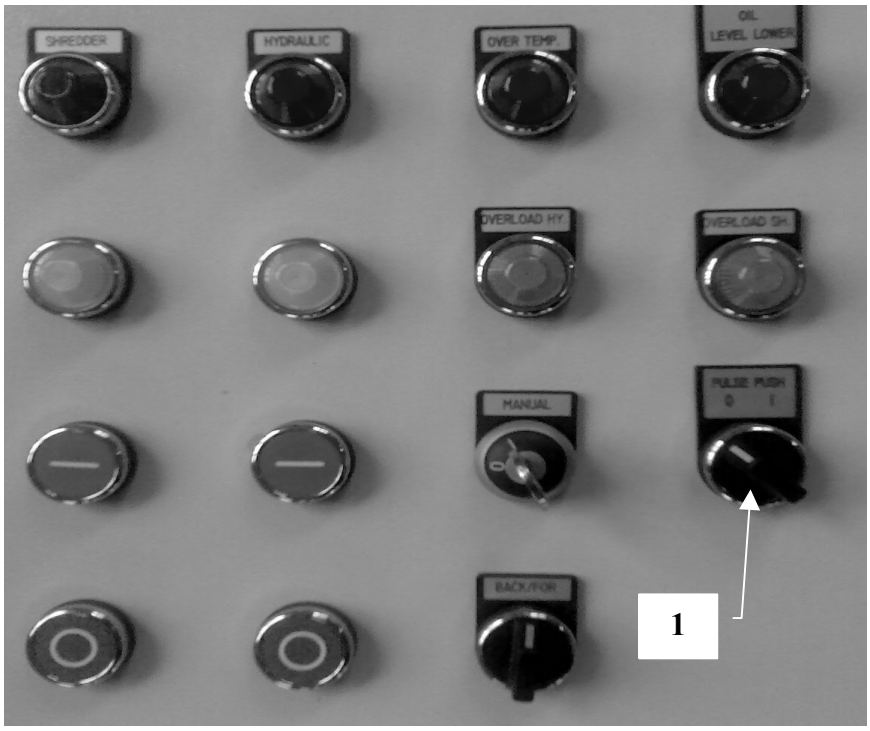
Pulse Push Function

In normal process mode, the ram pushes forward continuously until the ram arm reaches the proximity switch, reverses the function, and the ram moves backwards.

The ram moves forward in steps when the switch (1) is changed to “Pulse Push”. This means that after each step, the ram remains in position for a couple of seconds before it moves forward again.

This function should be used for very heavy applications and when overloading the system is a concern.

(1) Pulse push switch



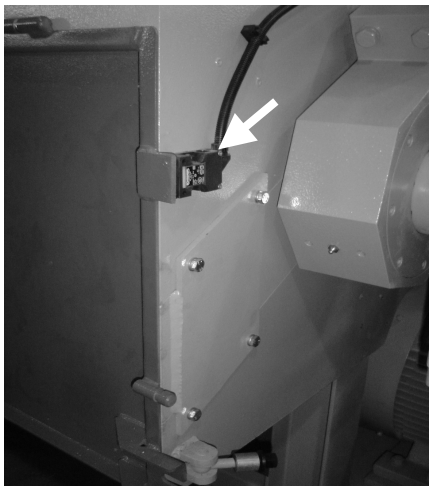
2-4 Safety Features

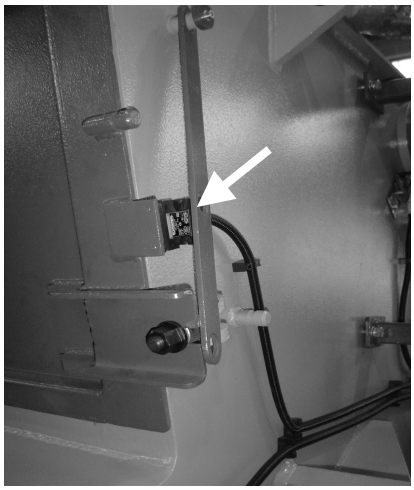
Protective Devices

⚠CAUTION ***The Machine may under no circumstances be operated without these protective devices. The use of faulty or manipulated protective devices is strongly prohibited.***

Safety Device for Housing Flap

Safety device: machine door





Safety device: hopper door

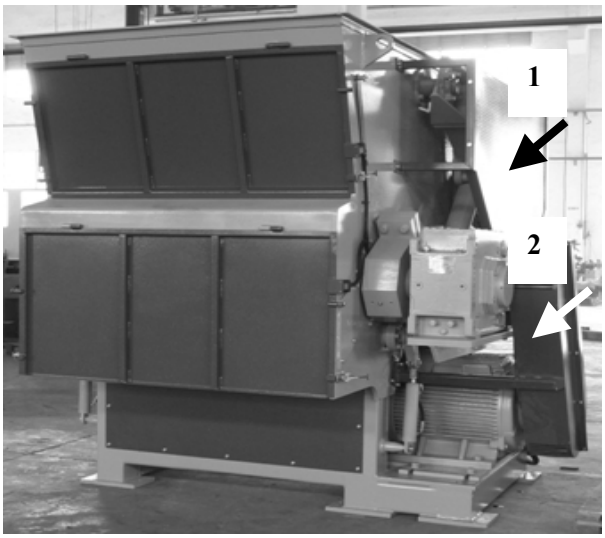
The shredder can only be operated if the doors are closed—deactivating the safety switch. The safety contact is broken when the machine or hopper door is open, thus switching off the machine.

V-Belts and Ram Guards

V-belt and ram guards are screwed to the machine. They can be dismounted for installation and maintenance work only when all rotating parts have come to a complete standstill and the machine is electronically locked out.

(1) Ram guarding

(2) V-belt guarding



NOTE: The operator must fit and mount the protective devices delivered with the machine according to current legal safety regulations if a machine is delivered without drive motors per request of the customer.

Safety Markings

Safety markings are attached to the machine. Should one of these markings becomes detached or is no longer recognizable, it must be replaced. New safety markings can be ordered through safety signage provides or from the manufacturer.

Personal Protective Gear

Wear close-fitting clothing. Hair must be pulled back, and loose jewellery is prohibited.

⚠CAUTION

The following protective gear must be worn when carrying out the following tasks:

	Safety helmet	Safety boots	Safety gloves	Safety goggles	Ear muffs
Unloading machine.	x	x	x		
Connecting machine.		x			
Operation.		x	x	x	x
Cleaning.		x	x	x	
Maintenance of bearings.		x			
Screen replacement.		x	x		
Maintenance of V-belts.		x			
Maintenance of cutting cutters.		x	x		
Cutter sharpening.		x	x	x	x

Emergency Stop Button

The machine may only be operated with the installed Emergency Stop buttons. An Emergency Stop Button must be mounted to the control cabinet and another on the grinding material in-feed.

Immediately press one of the Emergency Stop buttons in case of an emergency.

⚠CAUTION

The Emergency Stop must be activated in all situations where injury or damage could result!

Re-operation:

1. Eliminate cause of Emergency Stop.
2. Unlock Emergency Stop button
3. Acknowledge fault.
4. The machine is now ready for operation.

Chapter 3: Installation

3-1 Uncrating the Equipment

Requirements at Application Site

Check the application site to make sure it conforms to the qualifications listed below.

- The site is an enclosed space.
- The ground has sufficient load-bearing capacity (Refer to "Technical Specifications" in the Appendix for machine weight). The unevenness of the ground surface may not exceed 5 mm.
- The machine must be freely accessible from all sides.
- There must be sufficient room available for operating and service personnel.
- Spatial requirements: Refer to "Drawing and Diagrams" in the Appendix for machine dimensions. All hinged parts must be able to be opened completely.
- Vibration-free environment.
- The site has sufficient lighting.
- The machine may not be exposed to direct radiation caused by radiators or the sun.
- Room temperature: +41 to 104 °F (+5° to +40°C)
- Relative atmospheric humidity according to DIN 40040:
  15 to 70 % (indoor)

  NOTE: By humidity levels higher than 70 %, apply anticorrosive agent to the metallic-finished machine parts. Insulation for the tropics is also necessary.
- The machine may not be operated within range of static discharges or strong magnetic fields as this could lead to faults in the machine control system.

Unloading and Installing the Machine

The machine and components are packed so they arrive safely. Use a suitable crane or forklift for unloading the packaged machine and/or components.

1. Remove the packaging material and all transportation safety devices after unloading the machine.
2. In the case that the shredder and its accessory components have been delivered as individual items, mount them at the site of application in accordance with the Assembly Drawing. This is the only way to guarantee there are sufficient piping parts, tubing, and cable connections, and that the linking places match.

⚠WARNING

SUSPENDED LOAD!

- ***Falling loads can cause serious injury or death.***
- ***Only use a crane or forklift suitable for the weight and the dimensions of the load.***
- ***Use suitable stopping equipment and pay attention to the gravity center location.***
- ***DO NOT step under the suspended load.***
- ***Wear a safety helmet in addition to basic protective gear.***

⚠WARNING

OVERTURNING OR FALLING MACHINE!

- ***Serious injury or death can result.***
- ***If erecting the granulator over a pit, on a frame, or on a platform, you MUST secure the machine by putting mounting screws through the holes on the mounting pads (see Assembly Drawing). If assembling the machine on solid ground, this safety device is not always necessary.***

3. Align the machine horizontally with the help of a suitable spirit level.
4. Do not use blocks to place underneath the machine; use metal strips to prevent buckling of the base frame. Make sure that an even distribution of weight is achieved on all the points of support.

3-2 Electrical Connections

⚠CAUTION

Electrical connections should only be made by a qualified electrician.

⚠WARNING

DANGEROUS VOLTAGE! Touching live parts can lead to serious injury or death. All work relating to the electricity of the machine may only be carried out by trained electricians. Observe the currently effective EMC regulations.

Voltage, current, frequency, and protection are marked on the type plate. The voltage tolerance is +/- 10%.

The electrical connection is to be carried out in accordance with the wiring diagram in the terminal box for machines not pre-wired by the manufacturer.

NOTE: When making electrical connections, the regulations of the local electricity authority must be followed. The required cable cross section required is determined according to the rated capacity of the units.

Use caution when operating specific equipment to prevent electrical shock. Installation, service, alterations, and/or modifications must only be done by qualified personnel and with high regard for safety. Not conforming to the requirements could result in bodily harm, death, or costly damage.

NOTE: Alterations to the wiring diagrams require approval. Failure to do this will exclude all guarantee claims.

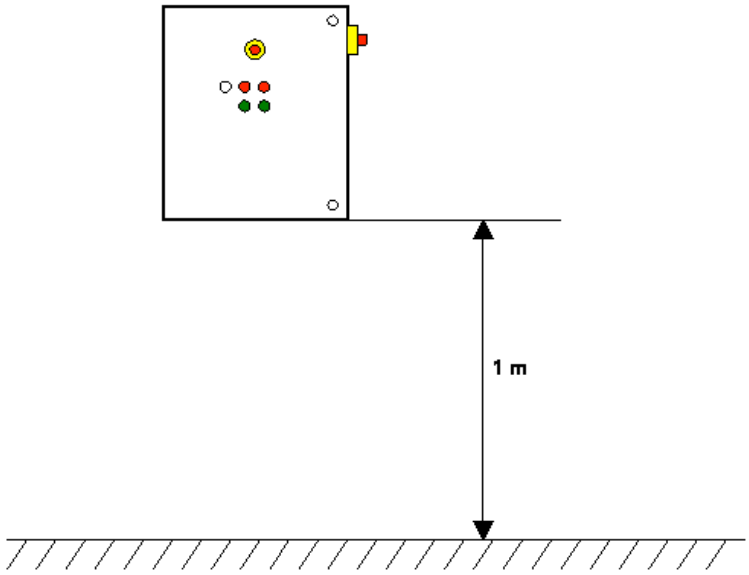
The wiring schematics are located in the control panel.

Connection of Emergency Stop Button

The machine may only be operated with installed Emergency Stop buttons. An Emergency Stop button must be installed at the control cabinet and at the grinding material in-feed if no Emergency Stop buttons have been installed at the factory.

NOTE: The control panel with the switches and Emergency Stop button must be installed near the machine. The distance should not exceed 5 m.

The distance between the floor and the lower edge of the control panel should be at least 1 m.



The connecting cables between the control panel and the machine must be protected against damage (cable tray, protective sleeve).

An additional Emergency Stop button has to be installed on the machine if the control box cannot be installed according to these rules.

Checking the Rotational Direction

Rotational direction of the motors must be checked before initial start-up. The following steps must be completed.

1. Switch the machine ON and then immediately OFF again.
2. Observe whether the discharge air fan in the drive motor is rotating in the direction of the direction arrow.

NOTE: If running in the wrong direction, reconnect the motor connection immediately. Damage to the machine will result from operation in the wrong direction.

3-3 Initial Start-up

General Advice

- All work related to start-up may only be carried out by trained and specialized personnel.
- Check the machine for possible transportation damage or other damage. If any damage exists, confirm it with the freight company and report it to the manufacturer.
- After setting up for service and before starting up for the first time, necessary checks must be completed.
- Check the oil level of the gear box before operating the machine.
- Fill oil into the hydraulic tank.
- Please observe the operation manual from the manufacturer!

Machine Check Prior to Start-up

- ✓ Use a torque wrench to check the cutter mounting screws when lower housing flap is open.
- ✓ Search the grinding chamber for foreign matter.
- ✓ Open the lower housing flap and make sure the screen has been inserted in accordance with the regulations.
- ✓ Close upper housing flap and fasten screws tightly.
- ✓ Check oil level of the gear box.
- ✓ Fill oil into the hydraulic unit.
- ✓ Examine in-feed device (accessories) for foreign matter.
- ✓ Check that the Emergency Stop buttons are unlocked.
- ✓ Check all safety devices for proper functioning.
- ✓ Switch ON machine for a short period of time and check rotational direction. The rotational direction can be seen at the discharge air fan of the drive motor (observe running direction arrow).
- ✓ Switch ON hydraulic unit for a short time and check rotational direction.

- ✓ Allow machine to run for approximately 10 minutes without shredding material.
- ✓ Connect material discharge device and in-feed device; check rotational direction drives.
- ✓ Feed grinding material uniformly. Too much grinding material can lead to overload of the machine.
- ✓ Check the temperature of the shredded material if necessary.
- ✓ Monitor the ammeter. This displays the present current consumption and gives information on the load of the machine.

Chapter 4: Operation

4-1 Start-up

⚠WARNING

No persons should operate the machine until they have read and understand all parts of the operation manual.

Machine Check—Before Switching Machine ON

- ✓ Cutters and bed knives are properly set and the screws are tightened with the specified torque.
- ✓ Screen is inserted into the screen support according to the instructions, and the screen support is fixed at the end position with tightened mounting screws.
- ✓ The cutting chamber is free of foreign matter.
- ✓ The machine and hopper doors are closed.
- ✓ All safety devices, including those of the installed grinding material in-feed and discharge devices, are checked and operative.

Switch ON Machine

1. Switch ON the material discharge device.
2. Switch ON the shredder (main switch to 1). Wait until the rotor has reached its full speed and switched from star to delta.
3. Switch ON the hydraulic system.
4. Switch ON the material in-feed device (accessories).

4-2 Operation Procedures

Manual In-feed of Material

⚠DANGER

Rotating Cutters!

Can cause serious cutting and crushing injuries that could result in death.

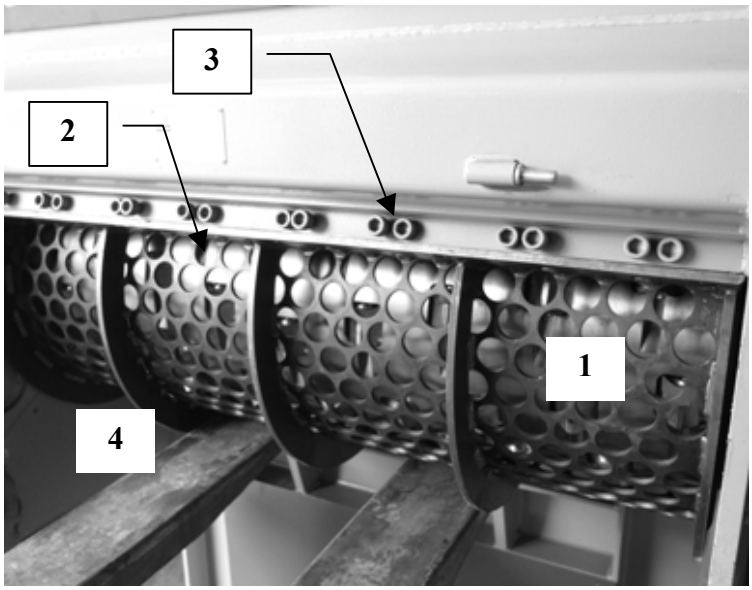
Do NOT reach into the in-feed hopper or lean in while the rotor is running. (Pay attention to the run down time). Only use approved grinding material.

- Throw the grinding material into the in-feed hopper.
- The machine should be fed from the front.
- If your machine has an additional in-feed device installed, please observe the additional information for working with the in-feed device.

Do not climb into the in-feed hopper while operating the machine. Death will result.

Emptying the Screen (standard screen)

1. Switch OFF the shredder at the main switch
2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard the machine door.
5. Hold the screen with a forklift.

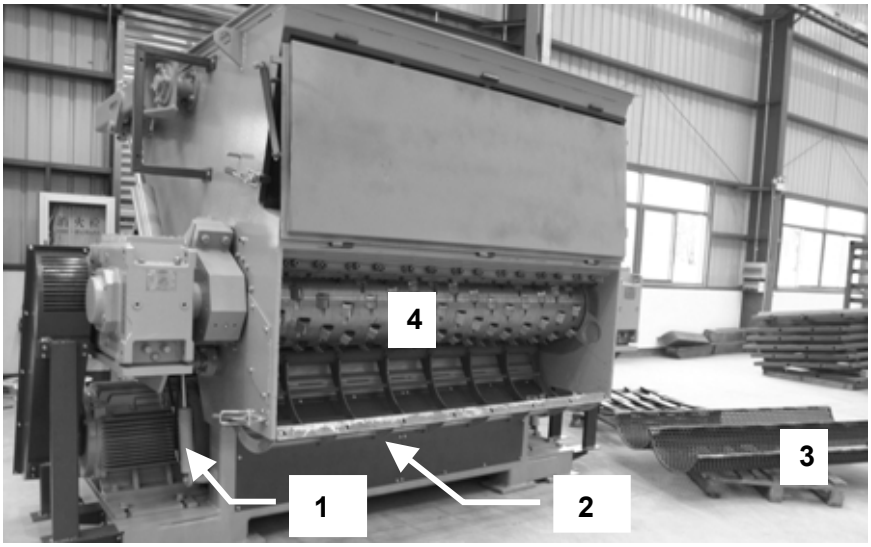


(1) Screen
(2) Screen mounting screws
(3) Cutter adjusting screws
(4) Forklift

6. Remove the screen.
7. Empty the screen.
8. Put the screen back using a forklift.
9. Fasten the mounting screws.
10. Close the machine door.
11. Shredder can be started again.

Emptying the Screen (hydraulic screen)

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the lower machine door.
4. Safeguard the machine door.
5. Pivot the screen support downwards by pushing the button screen open on the control box.
6. Remove the screen.
7. Empty the screen.
8. Put the screen back into the screen support.
9. Pivot the screen support into the working position and fasten using the mounting screws.
10. Close the machine door.
11. Shredder can be started again.



(1) Hydraulic cylinder
(2) Screen support
(3) Screen
(4) Rotor

4-3 Shut-down

Switch OFF Machine

1. Switch OFF the material in-feed device (accessories).
2. Wait until the remaining grinding material has been shredded, and then switch OFF the shredder (main switch to 0).
3. Switch OFF the material discharge device.

Chapter 5: Maintenance

5-1 Preventative Maintenance Schedule

Only trained and specialized personnel should carry out maintenance work.

Maintenance Plan

- ***Danger caused by electrical voltage and starting the machine during maintenance work. Death can result!***
- ***ALWAYS turn main switch to 0, safeguard using a padlock, and attach a warning sign while carrying out maintenance work.***

The tasks for maintenance work are described below.

Perform the following after every 8 operation hours:

- Check protective devices.
- Check cutting cutter mountings.
- Check condition of cutting cutters.

Perform the following after every 40 operation hours:

- Check V-belt tension force and V-belt condition.
- Check all screws of the machine for a tight fit.
- Check wearing parts.
- Check hydraulic oil level and consistence.

Per form the following after every 2000 operation hours:

- Change hydraulic oil
- Check gearbox oil level

Yearly maintenance:

- The purpose of yearly maintenance is primarily to check the general condition of the machine and to arrange for the supply of any necessary replacement parts. A service engineer can carry out this request.

5-2 Preventative and Corrective Maintenance

Checking the Protective Devices

Check the safety devices for:

- Stipulated condition
- Stipulated location
- Safe mounting
- Stipulated function

⚠WARNING

Danger due to non-functioning protective devices can cause serious injury or death!

- ***Eliminate all defects before operating the machine!***
- ***If defects occur during operation, stop the machine immediately and eliminate the defects!***
- ***Do NOT change or remove any protective devices. Do NOT put any protective devices out of action by modifying them.***

Cleaning the Machine

⚠WARNING

Danger of cutting caused by sharp cutting cutters—even when the rotor is not operating! Serious injury, especially to the hands and fingers, can result. Wear protective gloves!

Proceed as follows:

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the machine and hopper doors.
4. Safeguard the machine and hopper doors.
5. Remove the screen.
6. Empty the screen.

⚠WARNING

Inhalation of process dust is hazardous to your health! Never blow out the shredded material residue—always use suction instead! Wear breathing protection if necessary!

7. Pre-clean the cutting chamber using a hand brush.
8. Vacuum the remaining shredded material residue using a suitable device.
9. Remove clinging grinding material residue using a suitable wooden scraper.

10. Place the screen back into its working position and fasten with the mounting screws.
11. Close the machine and hopper doors.
12. Machine can be started again.

Replacing the Gear Box

The gearbox is made so a replacement is only necessary in exceptional cases. Dismounting and mounting the gear box requires specialist knowledge and a careful working method. Please observe the instructions given in the installation manual of the gear box manufacturer or ask the service department for help.

Replacing the Rotor

The rotor's design is heavy duty, so a replacement is only necessary after a crash, (i.e. a hammer fall inside). Dismounting and mounting of the rotor requires specialist knowledge and a careful working method. Call the Service Department for assistance.

Dismounting the Rotor

1. Dismount the V-belt cover.
2. Dismount the V-belts.
3. Dismount the gearbox.
4. Remove the screen.
5. Remove the rotor mounting slot cover plates from the housing.
6. Screw in hooks on both shaft ends.
7. Remove the bearing housing mounting screw.
8. Carefully lift out the complete rotor using suitable lifting and stopping equipment.
9. Lay the rotor down in a safe location using appropriately sized timber beams.

Mounting the Rotor

1. Before starting, clean the bearing seat surfaces and check the key.
2. Lift the rotor using suitable lifting and stopping equipment and place carefully into the bearing seats.
3. Attach the bearing housing (Pos.) to the bearing seats using screws.
4. Put the gear onto the rotor axis.
5. Put back the rotor mounting slot cover plates.
6. Put in the screen.
7. Pull on V-belts and adjust the V-belt tension force.
8. Attach the V-belt.

9. Carry out a test run.

NOTE: If the spare rotor is delivered without bearings, the bearings MUST be mounted first.

Replacing the Main Bearings

The main bearings of the machine are made so a bearing replacement is only necessary in exceptional cases. Dismounting and mounting of the bearings requires specialist knowledge and a careful working method. In addition to the following advice, please observe the instructions given in the installation manual of the bearing manufacturer or ask the service department for help.

The bearings mounted in this machine are indicated in the spare parts list. A suitable pulling-off device is a required for dismounting and mounting the bearings.

Dismounting the Main Bearings

1. Dismount the V-belt cover.
2. Dismount the V-belts.
3. Dismount the gearbox.
4. Pull the distance sleeve off the rotor axis.
5. Remove the screen
6. Remove the rotor cover plates from the machine housing.
7. Screw in hooks on both shaft ends.
8. Hang on rotor on both shaft ends.
9. Remove the bearing housing mounting screw.
10. Carefully lift out the complete rotor using suitable lifting and stopping equipment.
11. Lay the rotor down in a safe location using timber beams of appropriate size.
12. Loosen the mounting screws on the bearings cover.
13. Pull the bearing housing off with a pulling-off device.
14. Pull the bearing off the rotor axis using a pulling-off device.

Mounting the Main Bearings

1. Before mounting, clean the bearing surfaces and the shaft surfaces thoroughly and grease lightly.
2. Mount bearing in bearing housing.
3. Attach the bearing with the bearing housing to the rotor axis.
4. Lift the rotor using suitable lifting and stopping equipment and place carefully into the bearing seats

5. Attach the bearing housing to the bearing seats using screws.
6. Push the distance sleeve onto the rotor axis.
7. Put the gear onto the rotor axis
8. Put back the rotor cover plates
9. Put in the screen
10. Pull on V-belts and adjust the V-belt tension force.
11. Attach the V-belt cover.
12. Carry out a test run.

NOTE:

- **The roller bodies will be damaged unless the mounting forces engaged into inner ring.**
- **The hardened bearing rings are sensitive to impact stress; never hit the rings with the hammer. Use a brass arbor or a striking bushing (piping piece) made from a soft material. The inner diameter of the striking bushing should be only slightly larger than the diameter of the bearing base.**
- **The bearing is then pushed onto the shaft using light blows. The force of pressure must be evenly distributed on the circumference of the bearing ring.**

Lubricating the Main Bearings

An important requirement for high operational safety and long service life of the arrangement of bearings is the correct lubricant supply. Every machine is greased and checked in test runs before delivery.

NOTE: Unsuitable lubricant, lubricant deficiency, excessive lubricant, or impurities in the lubricant lead to overheating and extreme wear of the bearings.

Lubrication Intervals

Shift Operation	Replace Lubricant	Check
One shift operation	Every 18 months	Monthly
Two shift operation	Every 9 months	Monthly
Three shift operation	Every 6 months	Monthly

Check lubricant quality

You can judge whether the lubricant needs to be replaced by checking for the following features:

- Change in consistency
- Discoloration
- Degree of soiling

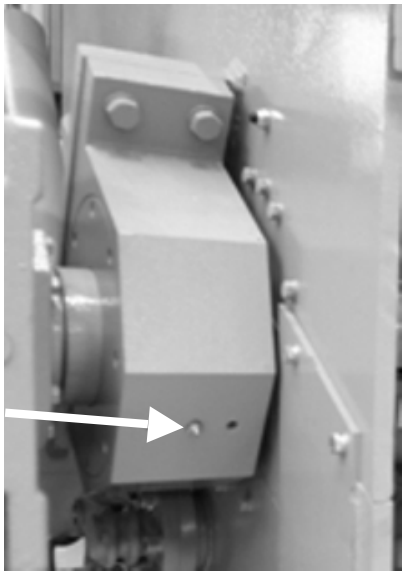
Replacing or Refilling Lubricant

- Fill the bearings uniformly with grease until all operating surfaces are well-greased.
- For the rotor bearings, a lubricant quantity of one third to a maximum of half of the bearing volume per bearing is required. If too much grease is used, the lubricant will become unusable due to excessive temperature.
- Only one type of grease may be used, mixing different types of grease is prohibited. The bearings have been filled at the factory with lithium base saponification roller bearing grease F3.
- Refer to the “List of Lubricants” in this section for recommended bearing grease.

Refilling lubricant

The grease reaches through the circulating grooves and bores via lubrication nipples into the interior of the bearing.

The greasing quantity is .13 to .22 lbs (60 to 100 g) roller bearing grease F3 per bearing.



Replacing Lubricant

Renewing the lubricant between intervals is only necessary when there unusual noises or overheating. Mounting and dismounting of the bearings must be carried out in accordance with the instructions in this operation manual (see replacing the bearings).

1. Open the bearing.
2. Remove the bearing housing and the bearing cover.
3. Clean the bearing carefully using petroleum ether.

NOTE: Petroleum ether, petroleum, spirit, aqueous neutral or alkaline cleaning agents may be used to clean the bearings. After washing out, the bearing must immediately be preserved using lubricant, in order to avoid corrosion.

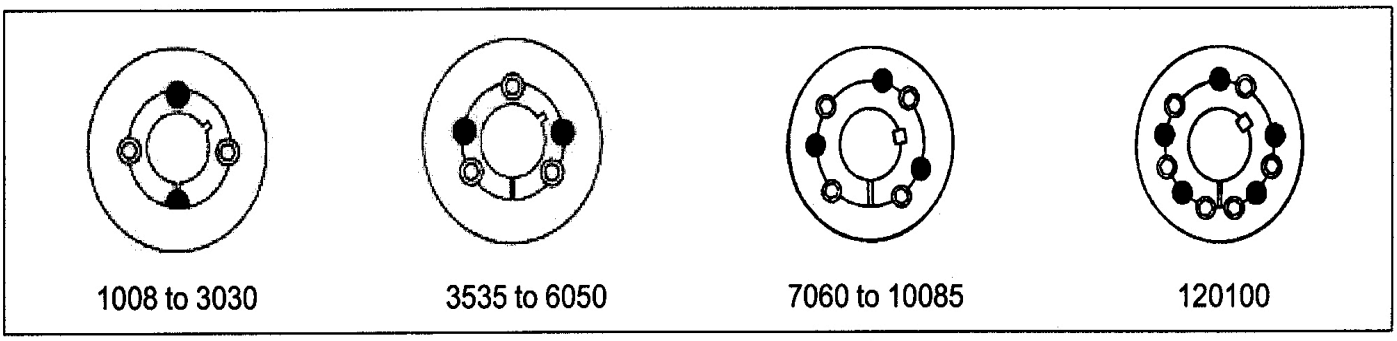
4. Fill bearing with approved lubricant (refer to "List of Lubricants").

List of Recommended Lubricants

Country of Manufacturer/Manufacturer	Roller Bearing Grease
ARAL	ARL Grease HL 3
BP	BP ENERGREASE LS 3
CASTROL	CASTROL SPHEEROL AP 3
ESSO	Beacon 3
FUCHS	FUCHS Grease 1200 FUCHS Grease FWA 220
SHELL	SHELL Alvania Grease 3
MOBIL-OIL	MOBILUX 3
WISURA	WISURA Liba L 3
Zeller $ Gmelin	ZET GE Grease M 50
FAG	FAG L 71
ANTAR	ROLEXA
Holland, Beverol	Beverol Multi Purpose Grease
Italy, Agip	AGIP Grease 33 FD
Swede, NYNAS	Nynas FI 3-42

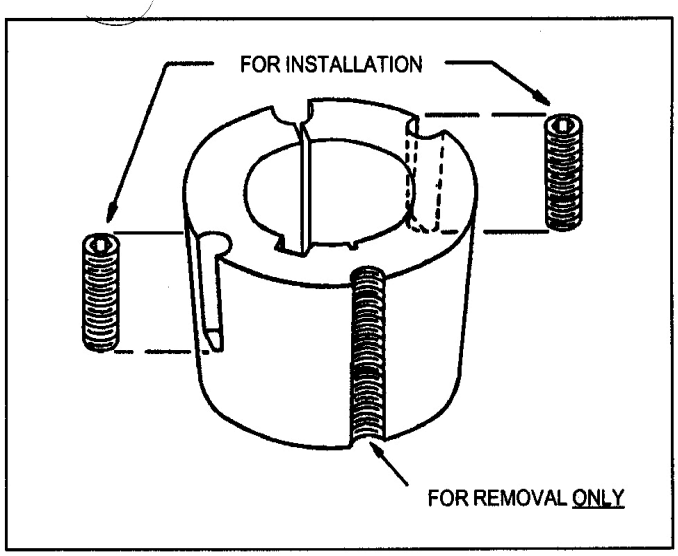
Mounting and Dismounting TAPER-LOCK Tensioning Element

The motor and the gear V-belt pulleys are attached to the shaft using a TAPER-LOCK tensioning element. The disks must be dismounted for certain maintenance processes.



To Install:

1. Clean shaft, bore, and outside of bushing, and bore of hub (taking bushing from hub if already assembled). Remove any oil, lacquer, or dirt. Place bushing in hub and match half holes to make complete holes (each complete hole will be threaded on one side only).
2. Oil thread and point of set screws or thread and under head of cap screws. Place screws loosely in holes that are threaded on hub side (shown thus ◎ in diagram).
3. Make sure bushing is free in hub. Slip assembly onto shaft and locate in position desired.
4. Tighten screws (see note*) alternately and evenly until all are pulled up very tightly. Use a piece of pipe on wrench to increase leverage. (See table for wrench torque on reverse side.)
5. Hammer against large end of bushing using hammer and block or sleeve to avoid damage. Screws can now be turned a little more using the specified wrench torque. Repeat this alternate hammering and screw re-tightening until the specified wrench torque no longer turns the screws after hammering.
6. After drive has ben running under load for a short time stop and check tightness of screws. Fill other holes with grease to exclude dirt.



To Remove:

1. Remove all screws. Oil thread and point of set screws or thread and under head of cap screws.
2. Insert screws in holds that are threaded on bushing side (shown thus ● in diagram). In sizes where washers are found under screw heads, be sure to use these washers. Note that one screw in each hub is left over and is not used in this loosening operation.
3. Tighten screws alternately until bushing is loosened in hub. If bushing does not loosen immediately, tap on hub.

Tightening Torque of the Screws

Refer to the table below.

Tensioning element (Type)	Screws- Tightening torque in Nm	Screw details Number	Size (BSW)
1008	5,6	2	1/4"
1108	5,6	2	1/4"
1310	20	2	3/8"
1315	20	2	3/8"
1210	20	2	3/8"
1215	20	2	3/8"
1610	20	2	3/8"
1615	20	2	3/8"
2012	31	2	7/16"
2017	31	2	7/16"
2517	48	2	1/16"
2525	48	2	1/16"
3020	90	2	5/8"
3030	90	2	5/8"
3535	60	3	1/2"
4040	102	3	5/8"
4545	155	3	3/4"
5050	185	3	7/8"

Replacing the Screen

The condition of the screen must be checked regularly in order to keep the throughput of the shredder and the quality of the shredded material constant.

The screen may be damaged, dirty or not suitable for shredding material when:

- Screen holes are too fine—overheating of the shredded material can occur.
- Screen holes are too course—shredded material can have larger pieces that are unacceptable.

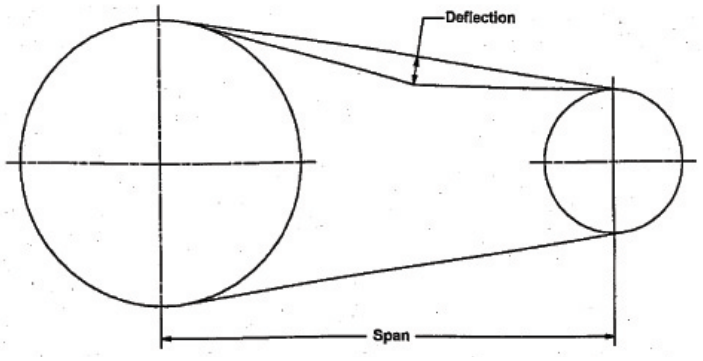
Standard Screen and Hydraulic Screen

Please refer to the section “Emptying the Screen” in Chapter 4.

V-Belts

V-belts are wearing parts that stretch and must be re-tensioned. Regular checks on the tension force of the V-belts and the condition of the V-belts are necessary in order to guarantee a long service life.

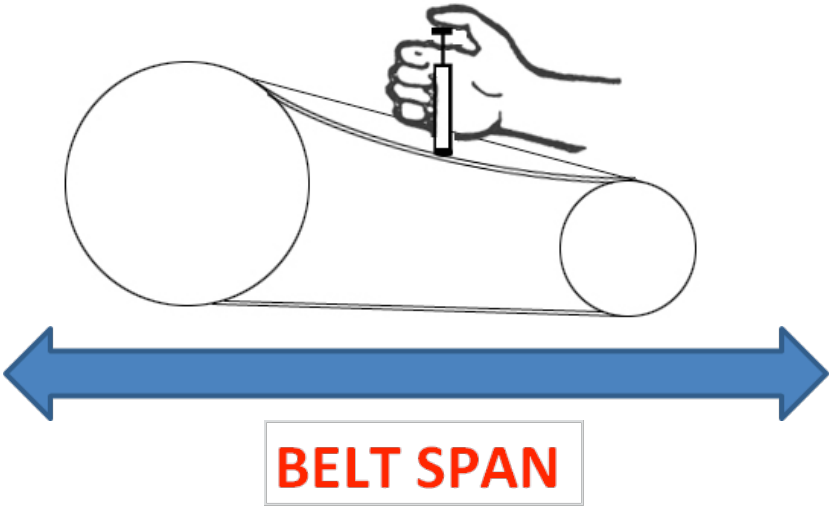
Checking and adjusting the tension force of the V-belt



1. Verify that the alignment of the pulley is correct. Utilizing a straightedge of sufficient length to span from one pulley to the other, place it along the sides of both pulleys. The entire face of each pulley should fully contact the straightedge.
2. Measure the belt **SPAN** with a measuring tape. Record this dimension in your note book.
3. Using the deflection tester, apply a perpendicular force at the midpoint of any one of the belts to deflect the belt 1/64th of an inch.
4. Calculate the deflection force:

   FORCE[Lb]= SPAN[IN] X (1/64)[Lb/IN]

5. Identify the belt type and measure the small sheave diameter. Look up the proper model belt deflection force table and find out what the force is supposed to be.
6. The motor position should be adjusted until the actual deflection force matches the force listed in the table.



⚠CAUTION

7. In no case should the belts be over tensioned, as this can significantly reduce belt and/or bearing life

BELT CROSS SECTION	SMALL SHEAVE DIAMETER RANGE	DEFLECTION FORCE (Lbs)
SPA	3.9-5.2	5.9
SPA	5.5-7.9	7.7
SPB	6.2-8.9	11
SPB	9.2-12.4	14.3
SPC	8.8-14.0	19.8
SPC	14.7-22.0	26.4
XPB	8.8-9.84	7.7

Checking V-belt condition, replacing V-belt

⚠CAUTION

Running V-belts can pull objects into the machine! Hair, jewelry etc. can be pulled into machine without proper precaution resulting in serious injury. NEVER dismount the V-belt cover and window during operation.

If a V belt is porous or ripped, it must be replaced as follows:

1. Remove the V-belt cover.
2. Loosen the front and rear tensioning screw.
3. Relax the V-belt by shifting the drive motor.
4. Put new V-belt in.
5. Tension the V-belt (refer to previous section).
6. Mount the V-belt cover.

Working on the Cutting Cutters

Correctly setting and mounting the cutting cutters is important when working with shredders to ensure efficient and economic function.

Replacing and Checking the Cutting Cutter Mountings

Certain machine parts are subject to stress during operation as a result of vibrations that can lead to loosening of the screw connections. Therefore, it is absolutely necessary to check the cutter and bed knife mounting screws in accordance with the Maintenance Plan.

1. Tighten the mounting screws on the cutters and bed knives using a torque wrench. (Check required torque for the screw size.) **The required torque for the cutter mounting screws is 120 Nm.**

NOTE: ***You can find out the required torque from the following table. Tightening capacity decreases for screw when loosened and tightened again several times.***

New screws of the same material quality must replace the cutting cutter mounting screws after they have been loosened and tightened several times.

Torque						
Screw type	**Grade 8.8**		**Grade 10.9**		**Grade 12.9**	
	Nm	**lb. ft**	**Nm**	**lb. ft**	**Nm**	**lb. ft**
M8	25	18.4	35	25.8	41	30.2
M10	49	36.1	69	50.9	83	61.2
M12	86	63.4	120	88.5	145	106
M16	210	154	295	217	355	261
M20	410	302	580	428	690	508
M24	710	523	1000	737	1200	885

Checking the Condition of the Cutters

Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

The cutting cutters become blunt after a certain number of operation hours; they should be checked regularly. Using blunt cutters can affect the efficiency and performance of the machine in the following ways:

- Decreased shredding capacity.
- Increased current consumption of the drive motor.
- Inexact cut.
- Overheating of the shredded material.

Dismounting the Cutters (see drawing below)

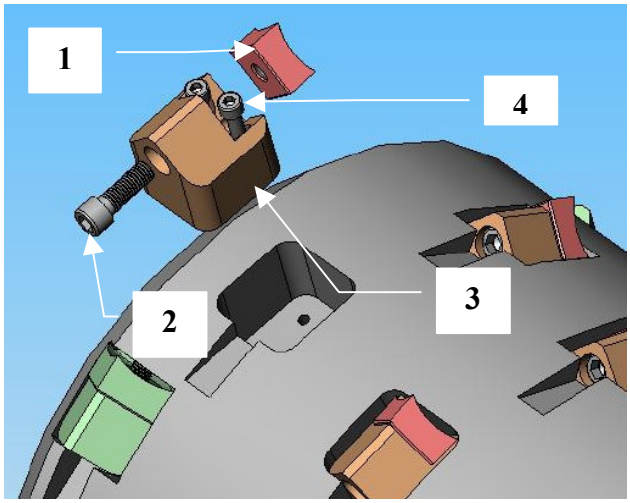
1. Switch OFF the shredder at the main switch.

2. Safeguard main switch using a padlock.
3. Open the machine door.
4. Safeguard the machine door.
5. Remove screen.

NOTE: Although it is possible to reach the cutting shaft by climbing into the feeding chamber, it is recommended to access the cutters through the machine door located at the front of the machine. The shaft can be rotated manually by turning the motor v-belt pulley.

6. Clean the hexagon head socket of the cutter mounting screw (2).
7. Loosen the screw using a high quality Allen key (10 mm). Knock the Allen key lightly with a hammer to loosen it if necessary.
8. Take out the cutter mounting screw, the washer, and the cutter.

(1) Cutter
(2) Cutter mounting screw
(3) Cutter holder
(4) Cutter holder mounting screws



Dismounting the Cutter Holders

1. Switch OFF the shredder at the main switch
2. Safeguard main switch using a padlock.
3. Open the lower machine door.
4. Safeguard the machine door.
5. Remove screen

NOTE: Although it is possible to reach the cutting shaft by climbing into the feeding chamber, it is recommended to access the cutters through the machine door located at the front of the machine. The shaft can be rotated manually by turning the motor v-belt pulley.

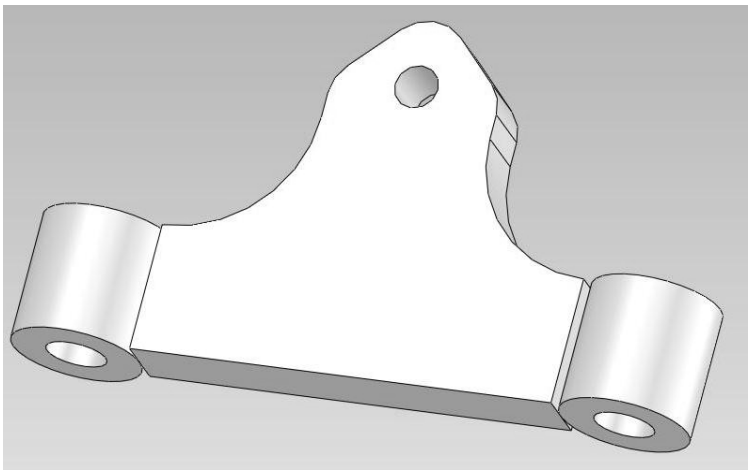
6. Clean the hexagon head socket of the cutter mounting screw (2).

7. Loose the screw using a high quality Allen key (10 mm). If necessary knock the Allen key lightly with a hammer to loose it.
8. Take out the cutter mounting screw, the washer and the cutter.
9. Clean the hexagon head socket of the cutter holder mounting screws (4).
10. Loose the screw using a high quality Allen key (6 mm). Knock the Allen key lightly with a hammer to loose it if necessary.
11. Take out the cutter holder mounting screws.
12. Remove the cutter holder with the delivered Extractor.

NOTE: See previous drawing.

⚠WARNING

Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!



Dismounting the Bed Cutters

1. Switch OFF the shredder at the main switch.
2. Safeguard main switch using a padlock.
3. Open the upper hopper door.
4. Safeguard the hopper door.

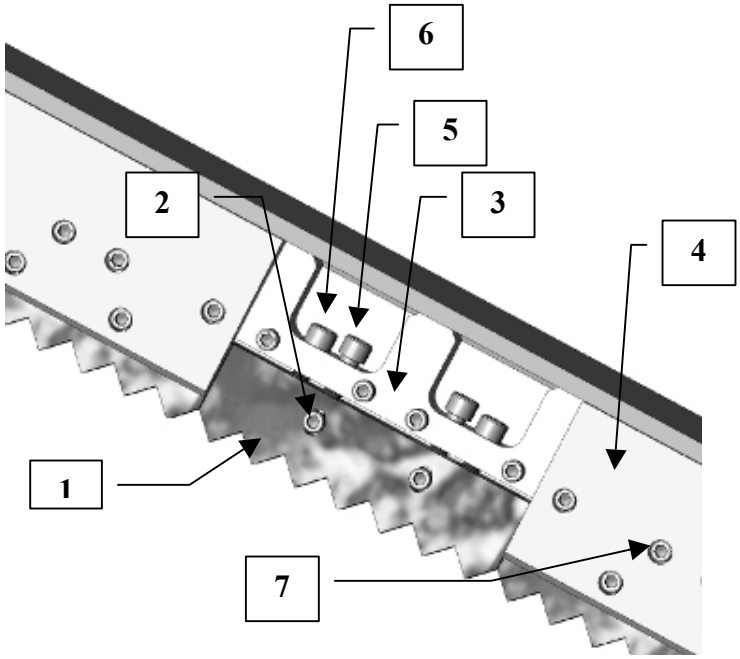
NOTE: Although it is possible to reach the cutters by climbing into the feeding chamber, it is recommended to access the cutters through the front side door.

5. Clean the hexagon head socket of the cutter mounting screws (2) and the cover plates mounting screws.
6. Loosen the cover plate mounting screws using a high quality Allen key (10 mm). Knock the Allen key lightly with a hammer to loosen if necessary.
7. Take out the screws and cover plates.
8. Loosen the cutter adjusting screws for pulling and take them out.
9. Loosen the cutter mounting screws with Allen key (10 mm). Use a hammer to lightly knock key if necessary.
10. Take out the cutter mounting screw and cutter.

⚠WARNING

WARNING! Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

(1) Bed knife
(2) Knife mounting screws
(3) Knife holder
(4) Cover plates
(5) Knife adjusting screw for pushing
(6) Cutter adjusting screw for pulling
(7) Cover plate mounting screws



Mounting the Cutter Holders

1. Clean the cutter pocket and the cutter holder.
2. Insert cutter holder into the pocket.

NOTE: Cutter holder must slide in easily. Do not damage the cutter holder surfaces with a hammer.

3. Put in the cutter holder mounting screws (DIN912 – M8x25 – 12.9) and put some Loctite on them.
4. **Make sure that the cutter holder fits properly.**
5. Tighten the cutter mounting screws using a torque wrench.

   NOTE: The required torque for the cutter holder mounting screws is 39 Nm (also see the table under "Working on Cutting Cutters").

Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Mounting the Cutters

1. Clean the cutter supporting surface and the hole on the cutter holder.
2. Insert sharp cutter or turn old cutter, and push against the cutter holder surface.
3. Put in the cutter mounting screw (DIN912 – M12x40 – 12.9) and the washer (DIN433 – 13 – 300HV).
4. Screw in the mounting screws and tighten lightly first.
5. **Make sure the cutter fits planar in the seat.**
6. Tighten the cutter mounting screws using a torque wrench.

   NOTE: The required torque for all cutter mounting screws is 120 Nm (also see the table under "Working on Cutting Cutters").

7. **Check if the cutting gap is correct and make sure the cutters do not collide as the rotor turns.**
8. Remove tools and other objects from the cutting chamber.
9. Put back screen and fix it.
10. Switch on the shredder for a short time without material, and listen for noises. If there are unusual noises, determine the cause and eliminate it.

    NOTE: The cutting knives, in particular the cutters, should only be sharpened or replaced in sets. There is a danger of balance error if a combination of rotor cutters from different cutter sets is used.

    Cutters are reversible and have four symmetrical cutting edges. This makes it possible to turn the cutters and only to sharpen after every fourth cutter change.

Mounting the Bed Cutters

1. Clean the cutter supporting surface and the holes on the cutter holder
2. Insert sharp cutter or turn old cutter.
3. Put in the cutter adjusting screws and adjust them roughly
4. Put in the cutter mounting screws (DIN912 – M12x55 – 12.9) and tighten lightly first
5. **Adjust the gap between cutter and bed knife to 0.8-1.0 mm**
6. Tighten the cutter mounting screws using a torque wrench.

NOTE: The required torque for all cutter mounting screws is 120 Nm (also see the table under* "Working on Cutting Cutters"*).

7. Turn the rotor by hand
8. **Check whether the cutting gap is correct and make sure the cutting cutters do not collide as the rotor turns.**
9. Put back the cover plates and mount them with the screws.
10. Remove tools and other objects from the cutting chamber.
11. Put screen back and mount it.
12. Switch ON the shredder for a short time without grinding material and listen for noises. If there are unusual noises, determine the cause and eliminate it.

NOTE: Cutters are reversible and have four symmetrical cutting edges. This makes it possible to turn the cutters and only to sharpen after every fourth cutter change.

Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Sharpening Cutters and Bed Knives

Shredder cutters have 4 cutting edges. This means they can be turned 3 times. The cutters should be replaced after the third use. Bed knives can be turned 2 times and can be re-sharpened as long as you can mount them with the long hole.

1. Dismount the cutting cutters (see "dismounting the rotor cutters").
2. Sharpen the cutters and bed knives.

NOTE: A specialist in accordance with the sharpening plan using particular care should uniformly sharpen the cutting cutters mechanically. It is important to make sure that sharpening takes place with small grinding allowance and sufficient coolant supply. The sharpening process is finished when the cutting edge is sharply cut. Not all indentations must be ground out; otherwise the

number of possibilities for sharpening is unnecessarily reduced. For the sharpening process, use soft grinding wheels (Quality 40 H or 46 K). Cutters, which have grinding cracks, are not to be reused due to danger of breakage during operation.

3. Whet the cutting edges of the cutting cutters using a whetstone.

NOTE: the service life of the cutting cutters can be increased by taking these measures.

4. Set the cutters and bed knives (refer to "Setting the cutters").
5. Mount the cutters and bed knives (see "Mounting the cutters and bed knives").

NOTE: The cutting cutters, in particular the cutters, should only be sharpened or replaced in sets. There is a danger of balance error if a combination of cutters from different cutter sets is used.

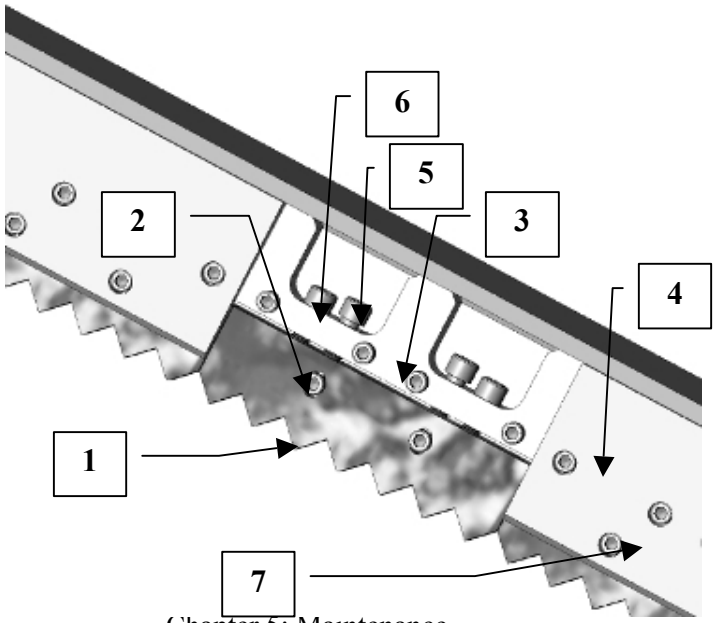
⚠WARNING

Danger of cutting caused by sharp cutters at all times—even when rotor is at standstill. Serious Injury especially to the hands and fingers can occur. Wear protective gloves!

Setting the Cutting Knives

Cutters for the CMS series shredder do not have to be adjusted. All adjustments have to be done with the bed cutters. To simplify cutter setting and shorten standstill periods when replacing cutters, bed cutters have 4 adjusting screws, 2 each for pushing and pulling the cutter. Having several cutter sets helps to avoid standstill periods. Correct and careful setting of the gap between the cutters and bed knives (cutting gap) is important for productive capacity of the shredder. Factors for the size of the cutter gap are the size of the rotor, the design of the rotor, and the material to be ground.

(1) Bed knife
(2) Knife mounting screws
(3) Knife holder
(4) Cover plates
(5) Knife adjusting screw for pushing
(6) Knife adjusting screw for pulling
(7) Cover plate mounting screws



1. Remove old knives (see “dismounting the bed knives”).
2. Insert sharp cutter or turn old cutter.
3. Put in the cutter adjusting screws and adjust them roughly
4. Put in the cutter mounting screws (DIN912 – M12x55 – 12.9) and tighten lightly first
5. **Adjust the gap between cutters and bed knife to 0.8-1.0 mm using a calibre gauge.**
6. Tighten the cutter mounting screws using a torque wrench.

   NOTE: The required torque for all cutter mounting screws is 120 Nm (see the table under “Working on the Cutters”).

7. Turn the rotor by hand
8. **Check whether the cutting gap is correct and make sure the cutters and bed knives do not collide as the rotor turns.**

   NOTE: Recommended cutter gap: 0.8 mm – 1 mm

9. Mount the cutter cover plates.

Transporting and Storing the Cutting Cutters

- ***Danger of cutting caused by sharp cutting cutters.***
- ***Serious injury, in particular to hands and fingers, can result.***
- ***Wear protective gloves.***
- ***Only transport and store the cutting cutters packaged.***
- ***Grease the cutting cutters well, so that they do not rust. Protect the cutting edges with doubled cardboard and use adhesive tape to safeguard the cutters against slipping out of the sides of the sheath.***
- ***After unpacking, you must de-grease the cutting cutters so that they can be gripped safely.***

Hydraulic Maintenance

Hydraulic oil has to be filled into the tank before start-up of the machine. The type of oil that should be used depends on location. Recommend oils include type DIN 51524 HLP 32 for areas with temperatures below 32°F (0°C) in the winter and HLP 46 for temperatures of around 86°F (30°C) in the summer. For extremely hot tropical areas (i.e. Thailand, Malaysia, Nigeria etc.) it is recommended to use HLP 68. The first oil replacement should be done after 1,000 operating hours and then after every 2,000 operating hours. The oil filter must be replaced too.

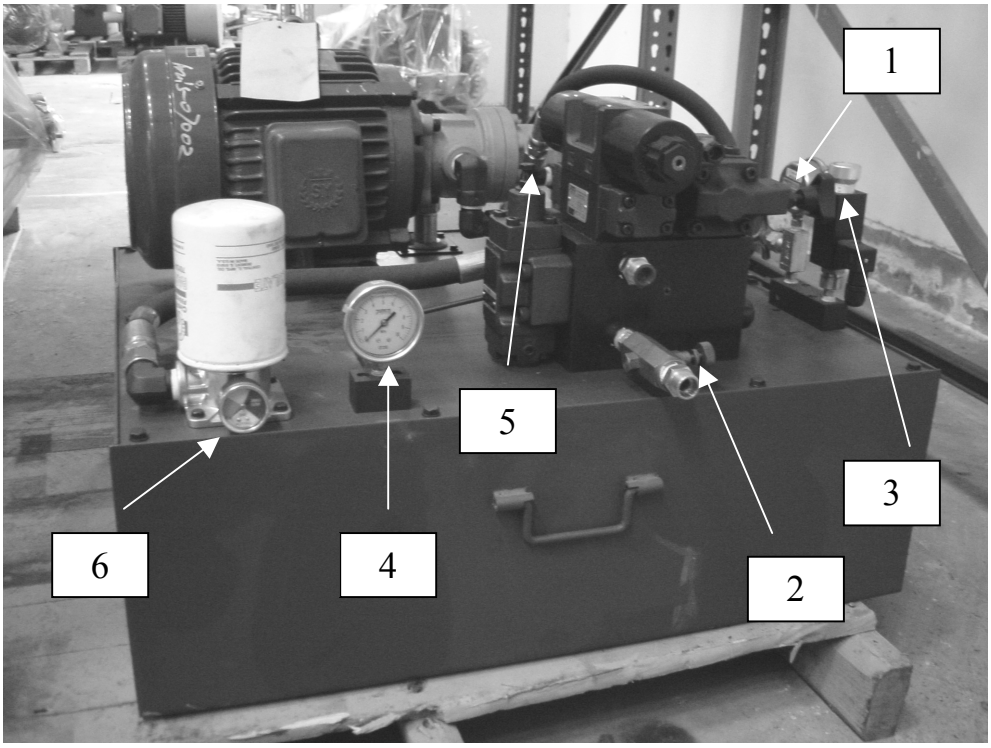
NOTE: Overheating of the oil and dirt in the oil will cause damage to the hydraulic system if the oil is not replaced in the specified amount of time. This can lead to complete standstill of the machine.

The same type of oil **must** be used when adding hydraulic oil. If the same type of oil is unavailable or if it is unknown, then the oil in the tank and the entire hydraulic system has to be removed and carefully and completely flushed. The system may only be filled with new oil after this procedure has been done because it is necessary in preventing the valves from gumming.

Checking and Adjusting of the Hydraulic System (see figure below)

1. Start the machine in automatic running mode and wait for approximately 20 minutes.
2. When the ram moves forward the pressure gauge (1) should indicate 0 – 30 bars depends on the adjustment of the throttle check valves (2). (Also adjust the speed of the ram with this valve.)
3. When the ram moves backwards the pressure gauge (1) should indicate 0 – 30 bars depends on the adjustment of the throttle check valves (2).
4. The pressure gauge (1) should indicate 50 – 70 bar at the change over point of the hydraulic cylinders other wise the spill over hand wheel (3) should be adjusted.
5. The pressure gauge (4) should indicate a maximum of 2.5 MPa other wise the screw of the sequence valve (5) has to be adjusted.
6. The ram should run upwards in less than 10 seconds, otherwise the throttle check valve (2) has to be adjusted.
7. When pressure gauge at the oil filter (6) indicates >5 bar, the filter should be replaced.

Figure: Checking and adjusting the hydraulic system



Hydraulic liquid recommendation

Designation to DIN 51 524	HLP 32
Ambient temperature:	-7 to +70°C
Supplier	Name of the oil
ARAL	Aral Vitam GF 32 Aral Vitam HF 32
BP	BP Energol HLP-D 32 BP Energol HLP 32 BP Energol SHF 32
ELF	Elfolna 32 Hydrelf 32
ESSO	Nuto H 32 HLPD-Oel 32
FINA	Fina Hydran 32
FUCHS	Renolin MR 10 Renolin B 10
MOBIL	Mobil DTE 24 Mobil DTE 17 Drucköl HLP 32 - C Hydrauliköl HLPD 32

TEXACO	Rando Oil HD A - 32 Rando Oil HD AZ - 32 Alcor Oil DD 32

Chapter 6: Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal troubleshooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

Problem	Possible Cause	Possible Remedy
Machine blocks or switches itself off	Too much feed material.	Reduce grinding material in-feed.
	Screen blocked.	Clean screen, check condition, select larger screen perforation if necessary.
	V-belts slip.	Check V-belt tension and condition. Re-tighten or replace if necessary.
	Cutter condition.	Check cutters and re-sharpen or replace if necessary.
	Cutting gap.	Check cutting gap and set following the instructions in this manual.
	Discharge blocked.	Check if discharge conveyor belt is running.
	Current failure.	• Check limit switch for defective contact. • Check electrical connection. • Tighten limit switch if necessary.
	Fuse too small.	Fit larger fuse **only after consulting the service department.**
	Rotational direction of rotor.	Check motor and reverse polarity if necessary.
	Rotor speed.	Change rotor speed **only after consulting the service department.**
Rotor does not grip bulky material.	Cutter condition.	Check and sharpen if needed following the instructions provided in this manual.
	Protruding bed cutter.	Consult the service department.
	Cutters not aggressive enough.	Fit underlay plates below cutter holders.
Problem	**Possible Cause**	**Possible Remedy**

Overheating of the shredded material.	View first 5 possible causes for “Machine blocks or switches itself off”	View first 5 possible remedies of “Machine blocks or switches itself off”
	Screen perforation too small.	Insert a screen with larger perforation.
	Cutters wrongly sharpened.	Modify cutter finish **only after consulting the service department.**
	Material rubs against the housing wall.	Fit anti-winding device.
	Insufficient cooling.	Fit rotor cooling.
Unusual vibrations.	Rotor out of balance.	Weight cutters, balance rotor.
	Bearing damage.	Check bearings and replace if necessary.
	Anti-vibration pads defective.	Check mounting pads and replace if necessary.
Extreme cutter wear.	Bearing damage.	Check bearings and replace if necessary.
	Cutter finish.	Check cutter and sharpen or replace if necessary.
	Wrong cutting gap.	Check cutting gap and set following the instructions in this manual.
	Foreign matter.	Fit feed device with metal detector.
Bearings too hot.	Too much grease in bearing.	Reduce amount of grease.
	V-belts too tight.	Reduce tension.
	Rubbing on housing sealing ring.	Check sealing ring and oil or replace.
	Bearing damage.	Check bearings and replace if necessary.
	No grease in bearing.	Lubricate bearing.
Too many fines in shredded material.	Screen worn.	Renew screen (possibly using manganese steel).
	Unsuitable screen perforation.	Replace screen **after consulting the service department.**
Problem	**Possible Cause**	**Possible Remedy**
Cutting gap alters during	Cutter mounting screws not	Re-tighten using torque wrench following the

operation.	tight.	instructions in this manual.
	Screw fatigue.	Fit new screws.
	Washers deformed.	Insert new washers.
	Cutter holder surface deformed.	Insert new cutter holders.
	Supporting surfaces not clean.	Clean and re-dust supporting surfaces.
	Threads in housing worn.	Fit new bushings in housing.
Screen damage.	Screen wrongly inserted.	Fit screen correctly.
	Screen support buckled.	Replace screen support.
	Wrong screen radius.	Correct it.
Shredder does not start.	Limit switches not activated.	Check position of limit switch and correct.
	Main and control fuses.	Replace fuse.
	Feed device not connected.	Switch on in sequence.
	Material jam.	Empty shredder before switching ON.
	Star delta connection.	Correct wiring on motor.
	Motor protection switches off.	Check motor relay for correct setting and increase if necessary.
	Star delta time relay.	Correct time.
Shredder blocks when under load.	Feed starts too early.	Start feed only after switch over from star to delta.
	Limit switch loose or wrongly set.	Re-position and tighten limit switch.
	Fuse defective.	• Replace fuse. • Fit larger fuse **only after consulting the service department.**
	Motor fuse switches off – red indicator.	• Reduce feed quantity of the grinding material. • Correct setting. • Replace fuse.
Frequent switching off of material in-feed device.	Current relay switches off	Correct setting.

Appendix

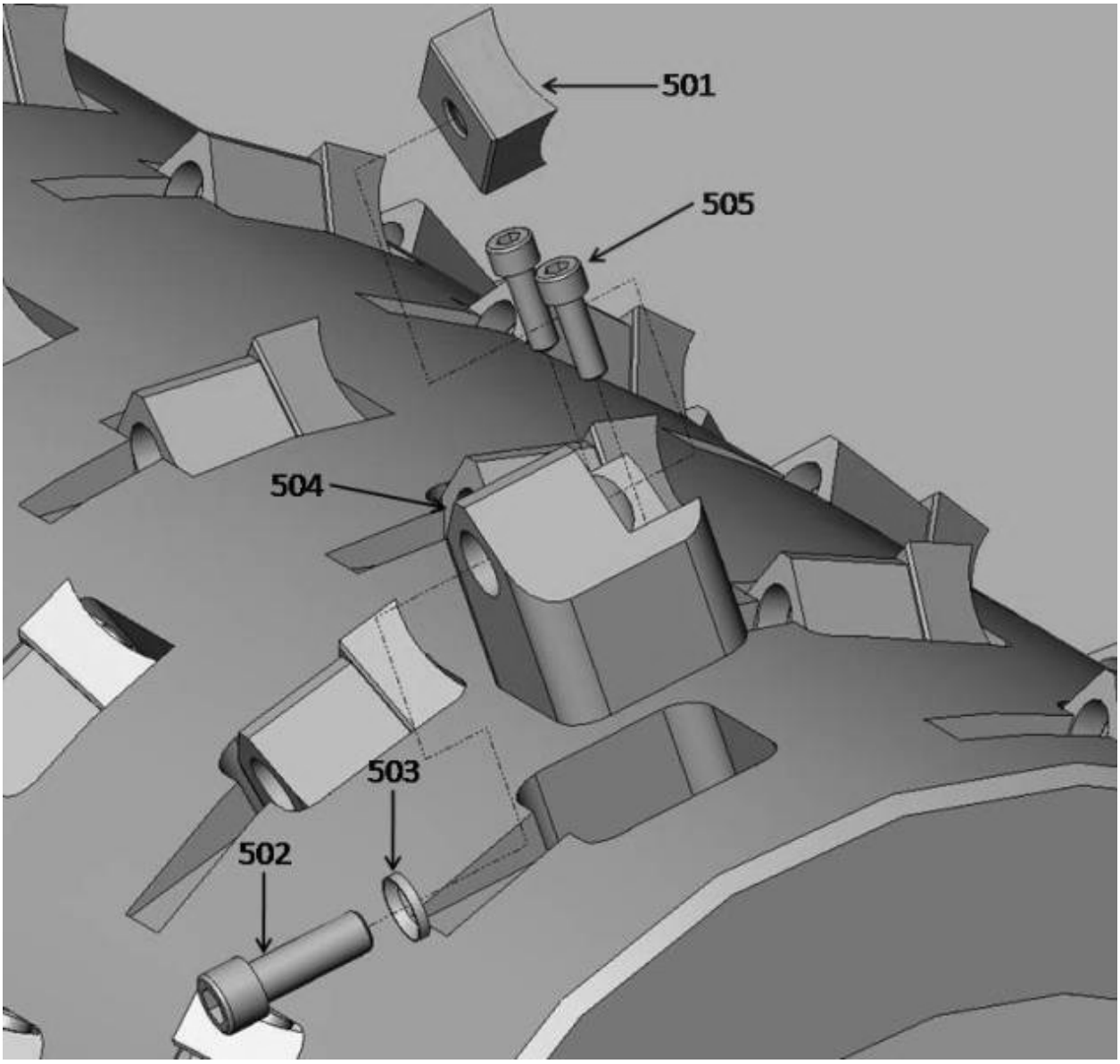
A-1 Technical Specifications

Specifications				
Model	850	1200	1500	2000
Feed Opening (mm)	1700x180 mm (67x46 in.)	1470x1920 mm (58x76 in.)	1745x1920 mm (69x76 in.)	2300x920 mm (91x76 in.)
Usable Open Area	700x730 (27.5x28.8 in.)	800x1010 (31.5x39.8 in.)	800x1290 (31.5x50.8 in.)	800x1850 (31.5x72.8 in.)
Rotor Dia. (mm)	387 mm (15.3")	457 mm (18")		
Drive Capacity (kW)	37 (50 HP)	55 (50 HP)	75 (101 HP)	2x55 (148 HP)
Rotor Speed (rpm)	80			
Rotor Knives A/B/E (pieces)	80/85/60	108/110/81	136/140/102	192/195/144
Bed Blades	3	4	5	7
Screen Size (mm)	20-100 (.79" - 4")			

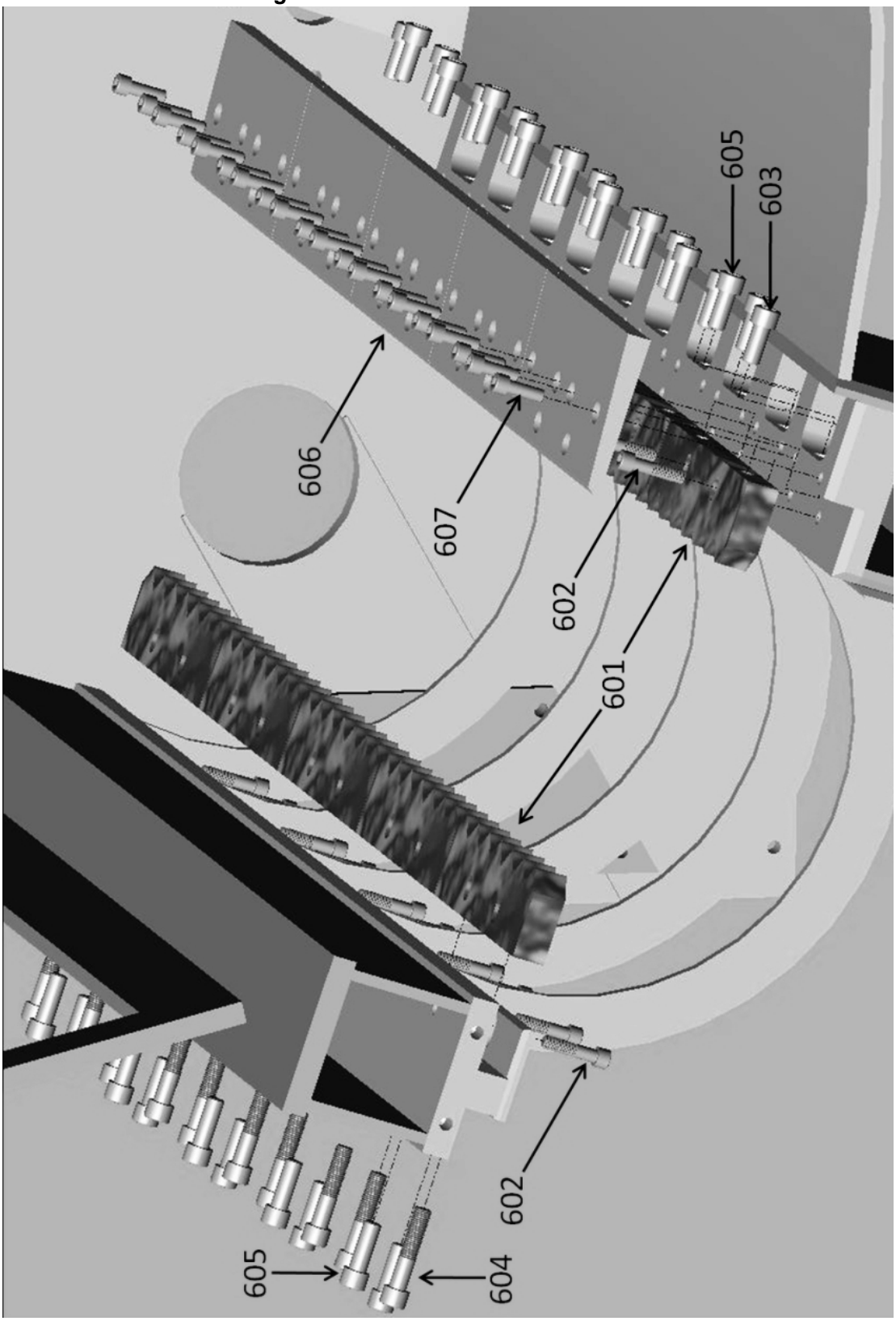
A-2 Drawings and Diagrams

NOTE: Please refer to the corresponding Spare Parts lists in the following section.

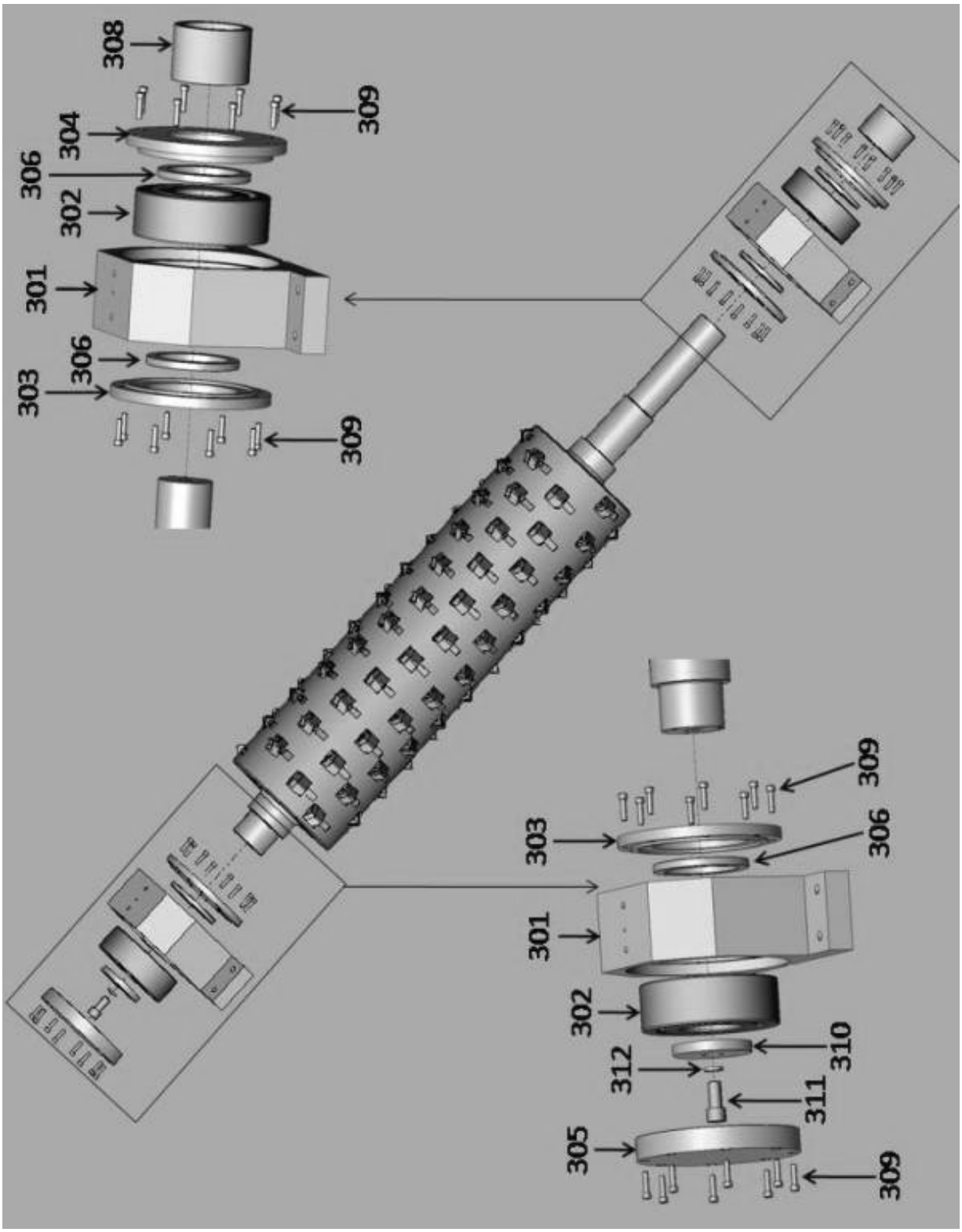
Cutter Mounting



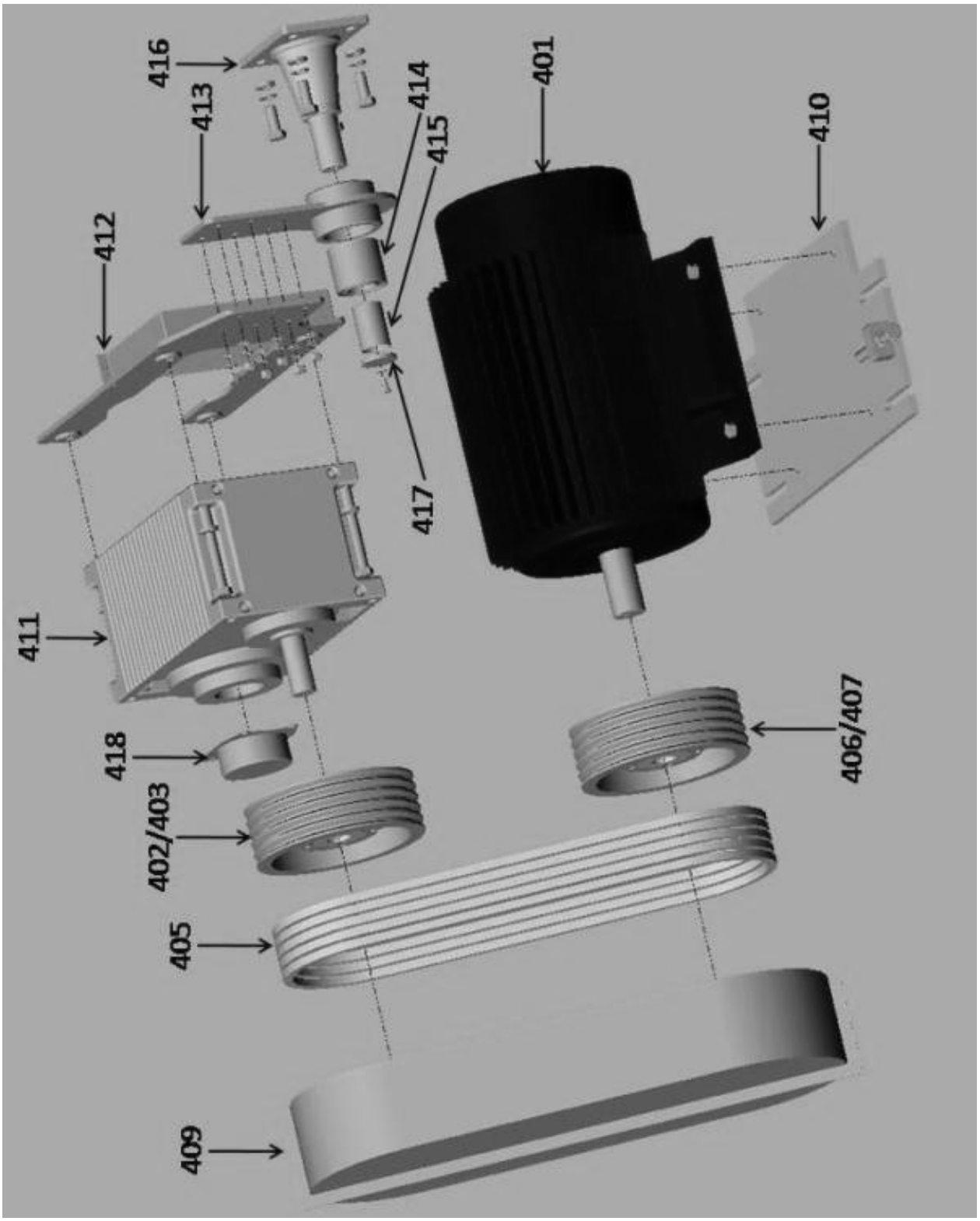
Bed Knife Mounting



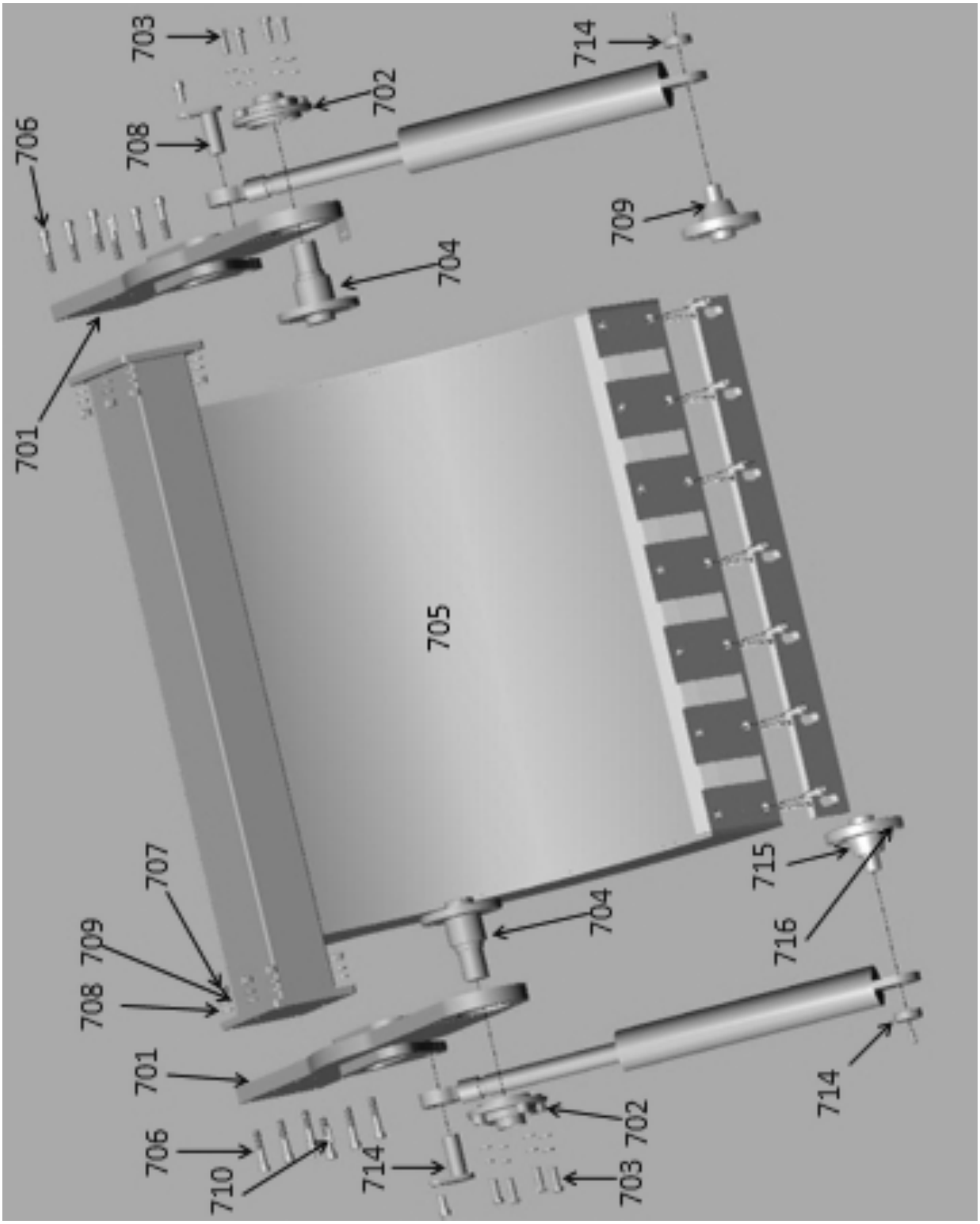
Rotor Assembly



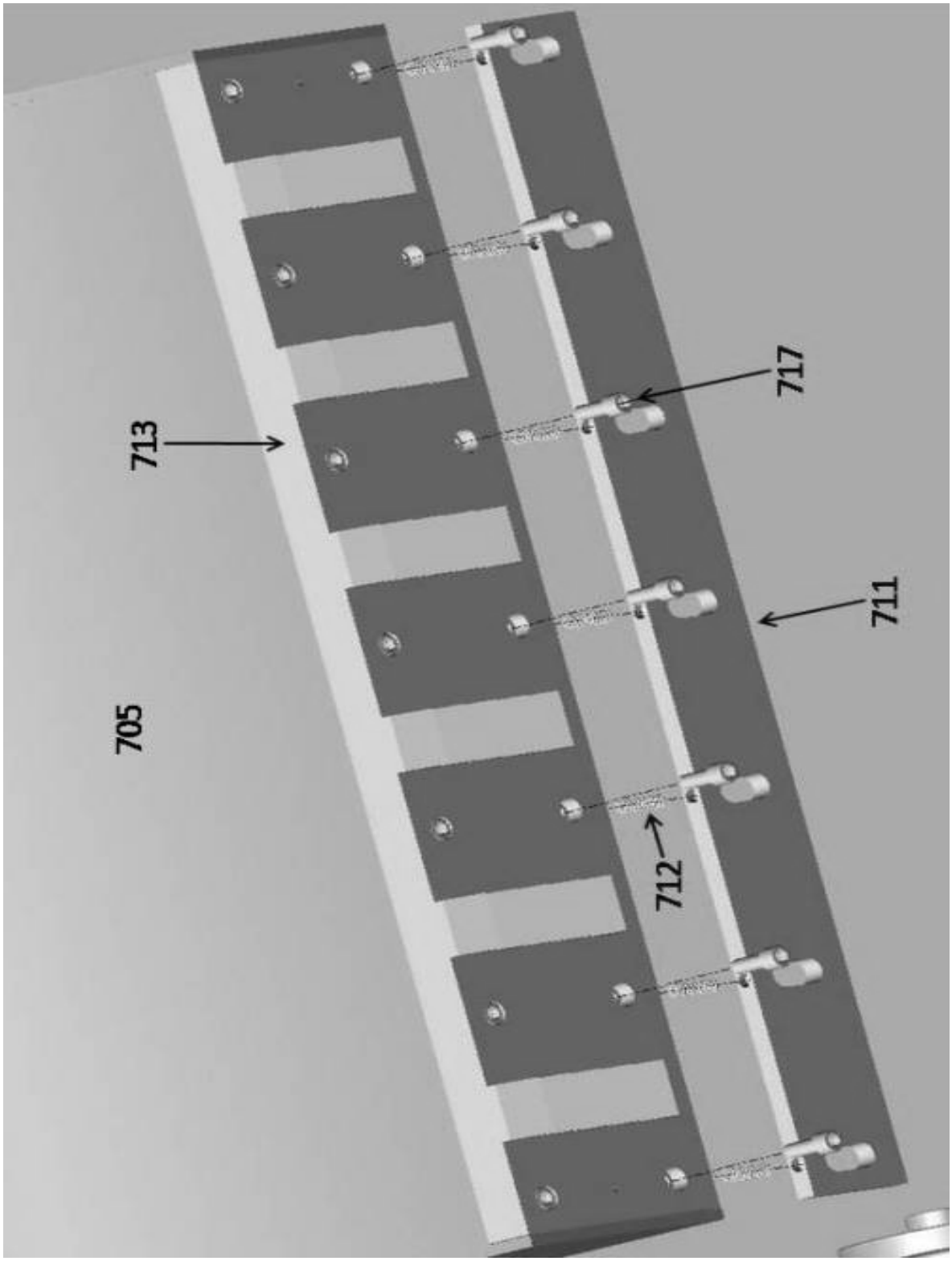
Drive



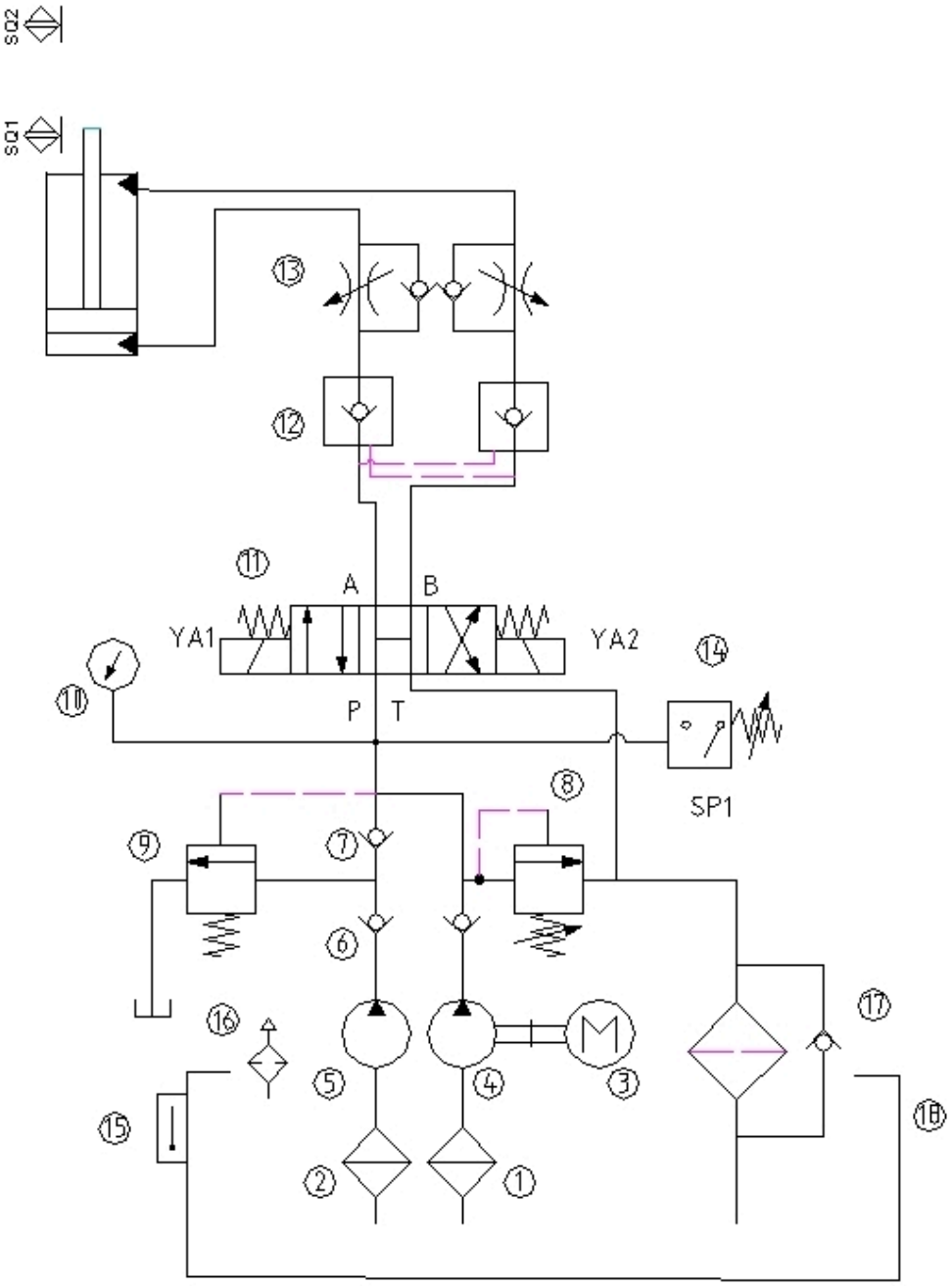
Ram



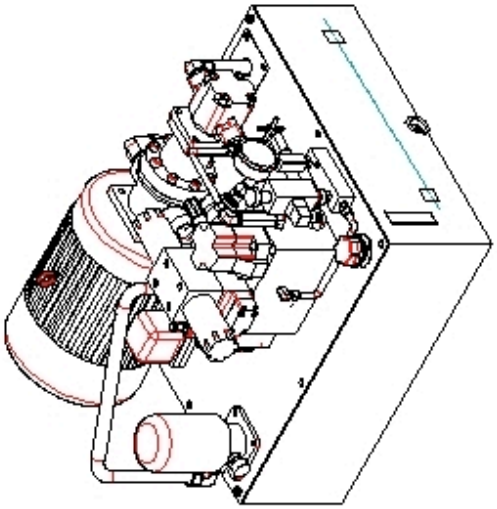
Ram scraper

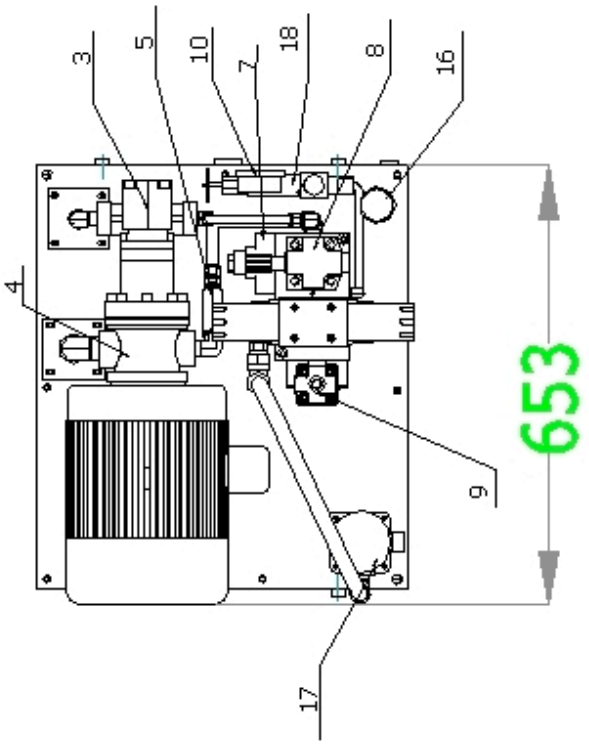


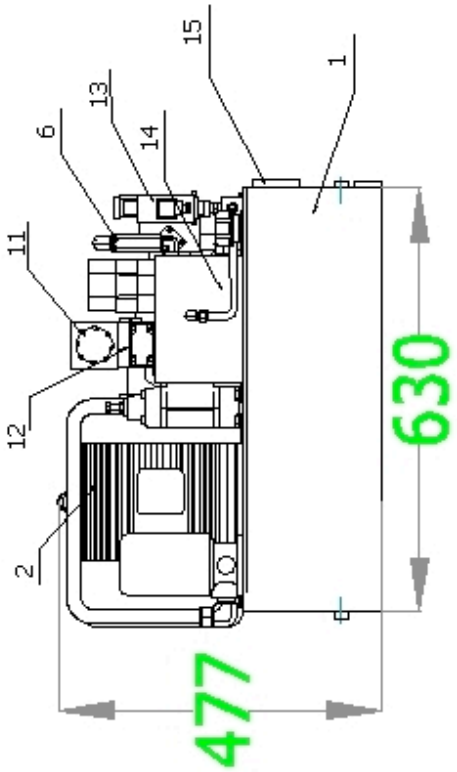
Model 850 Hydraulic Diagram



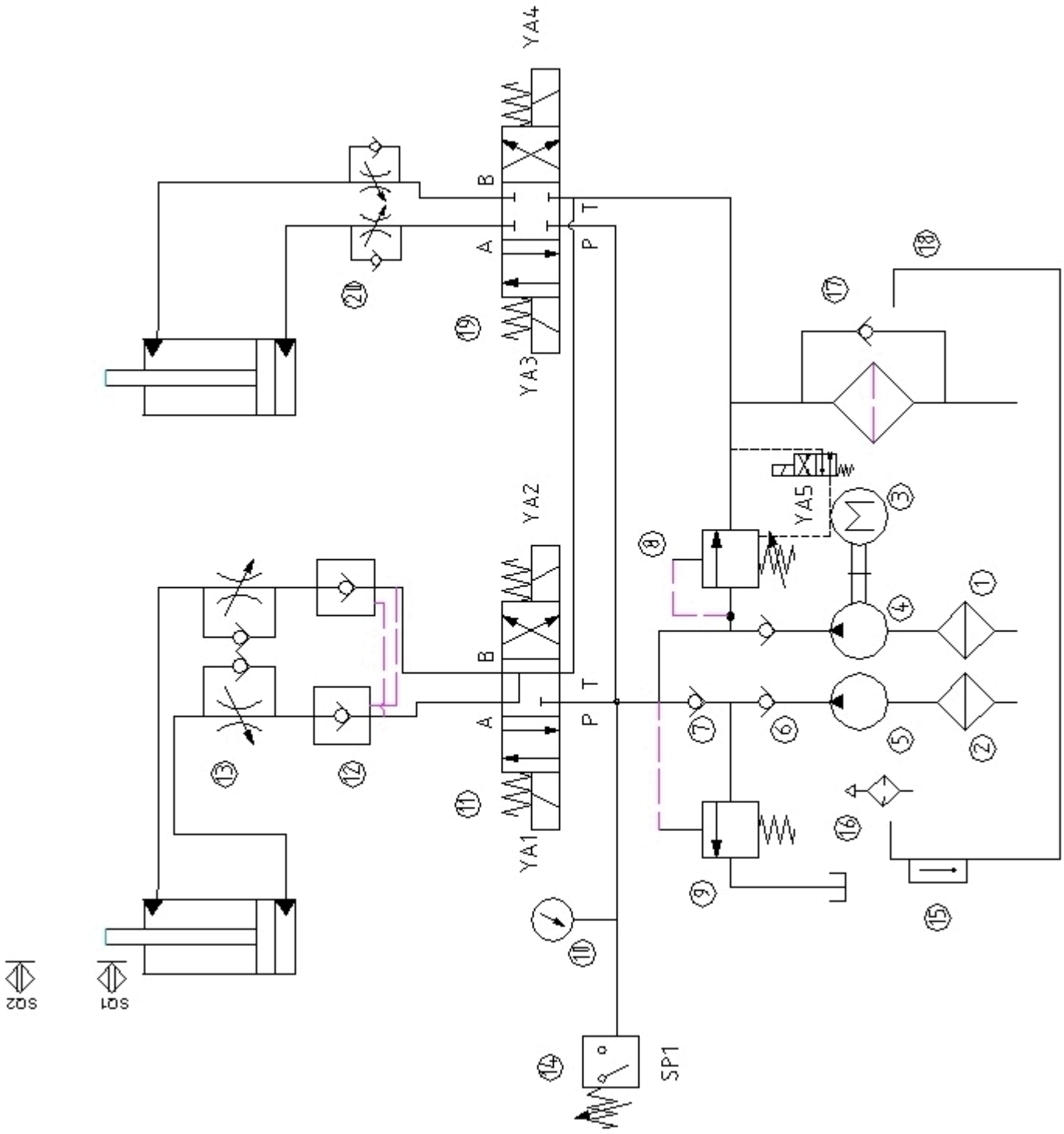
Model 850 Hydraulic Unit



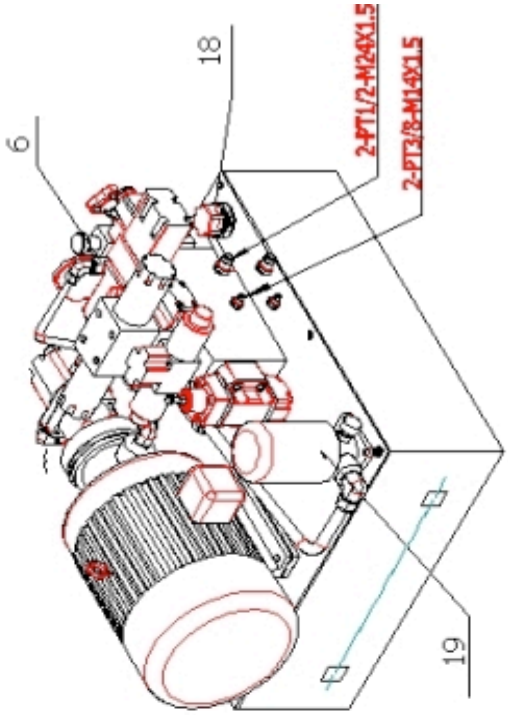


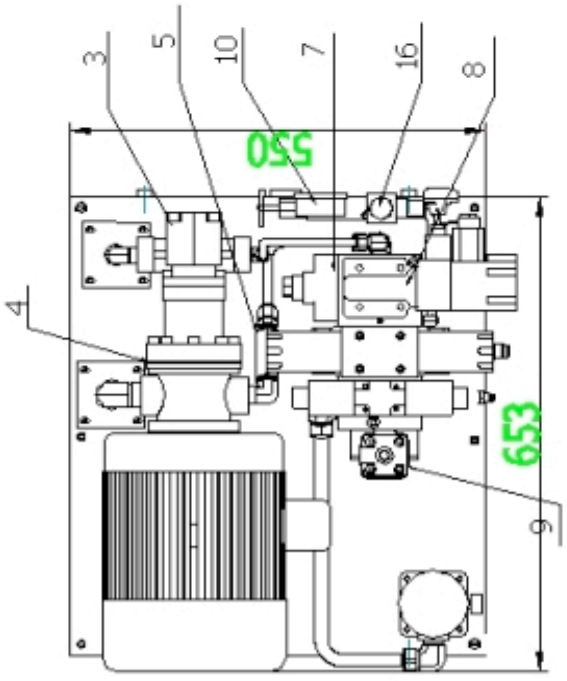


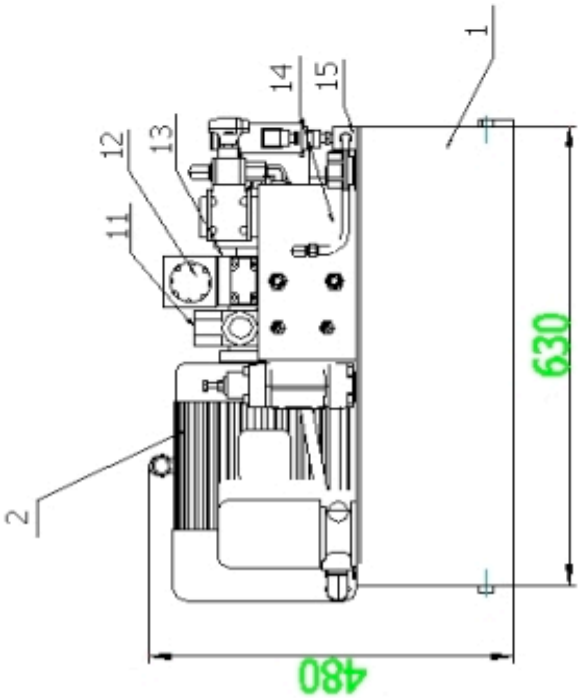
Model 850 Hydraulic Screen Diagram



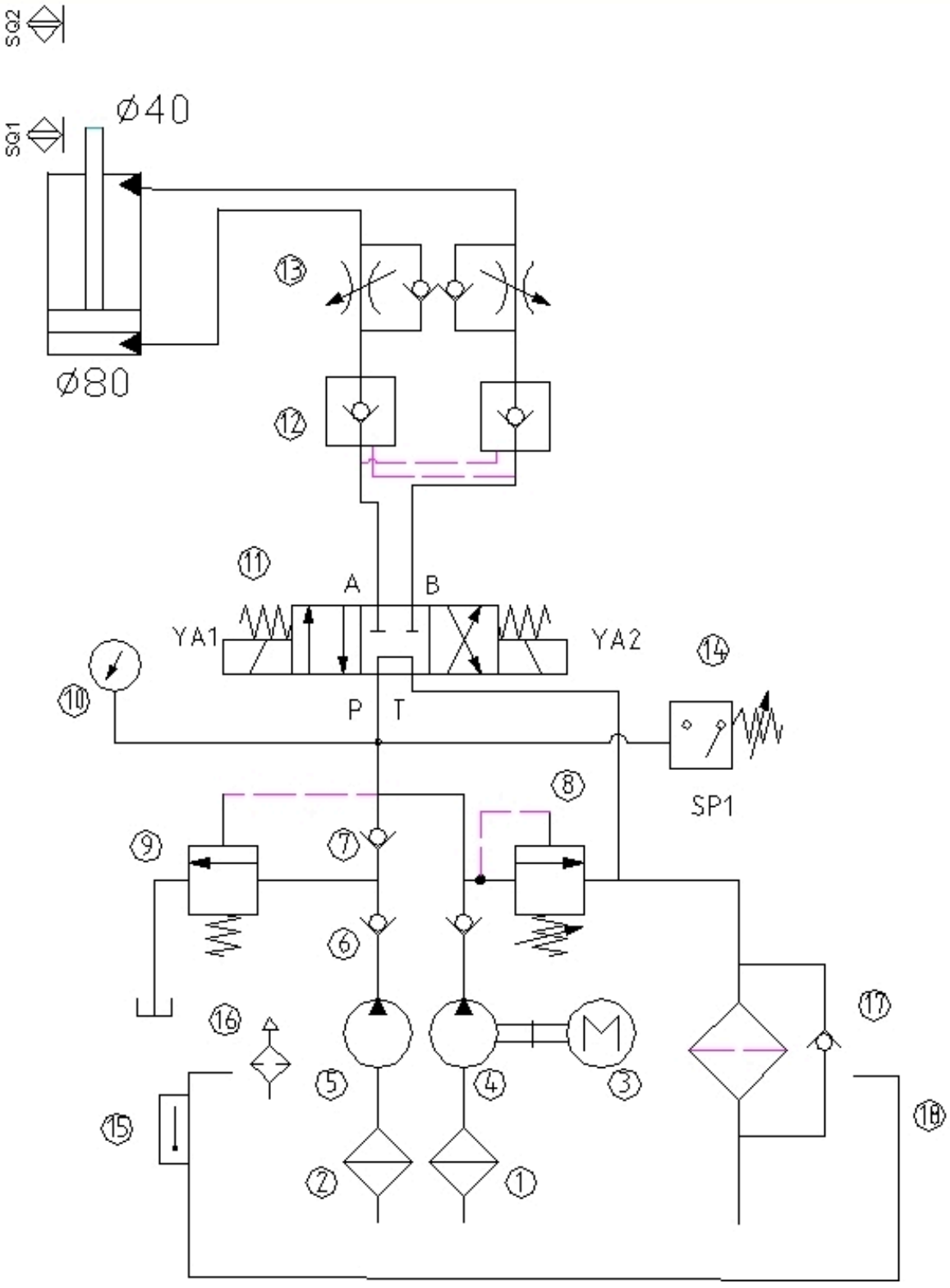
Model 850 Hydraulic Unit—Screen



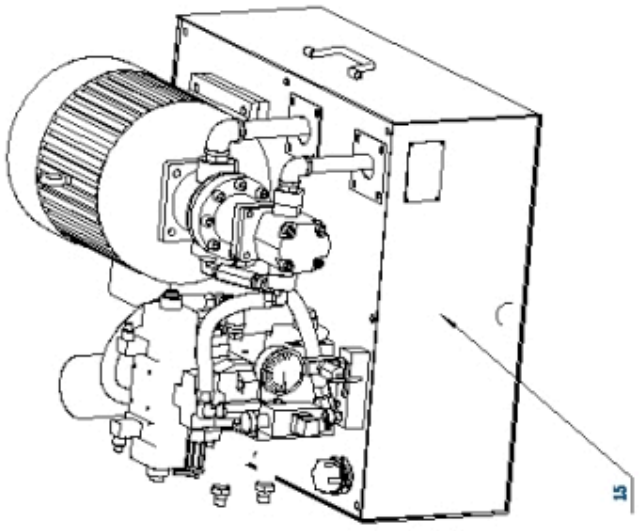


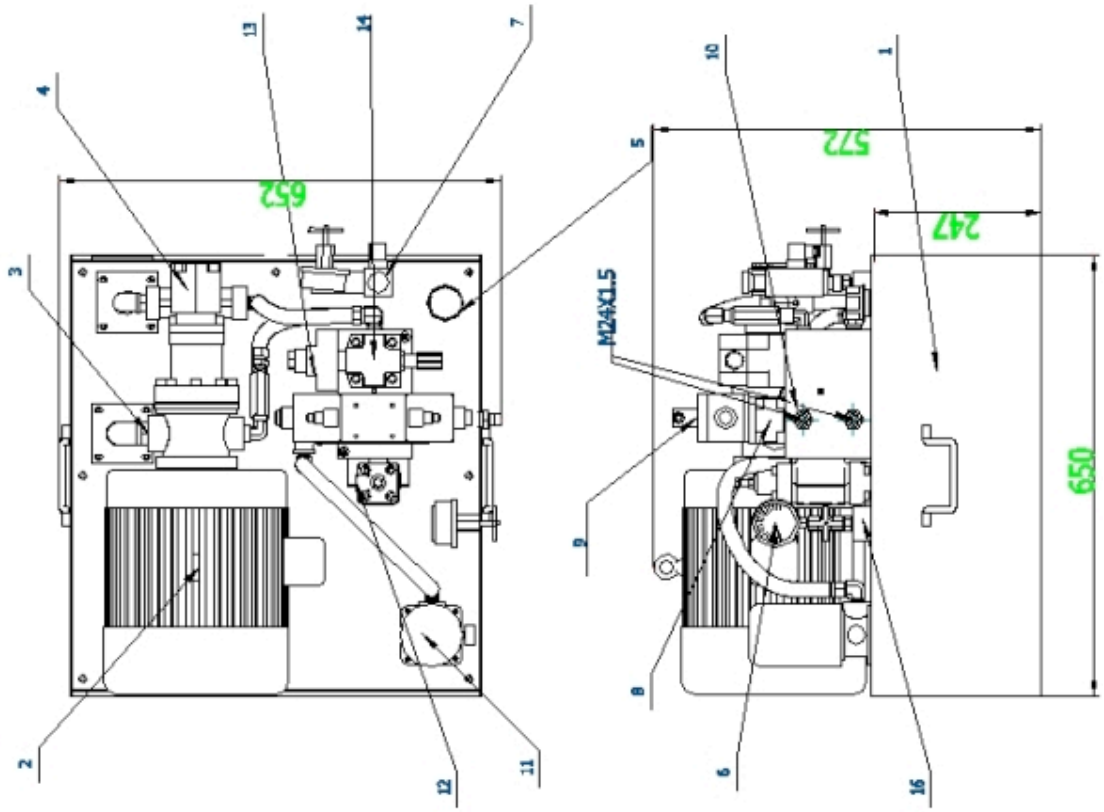


Models 1200-2000 Standard Hydraulic Diagram

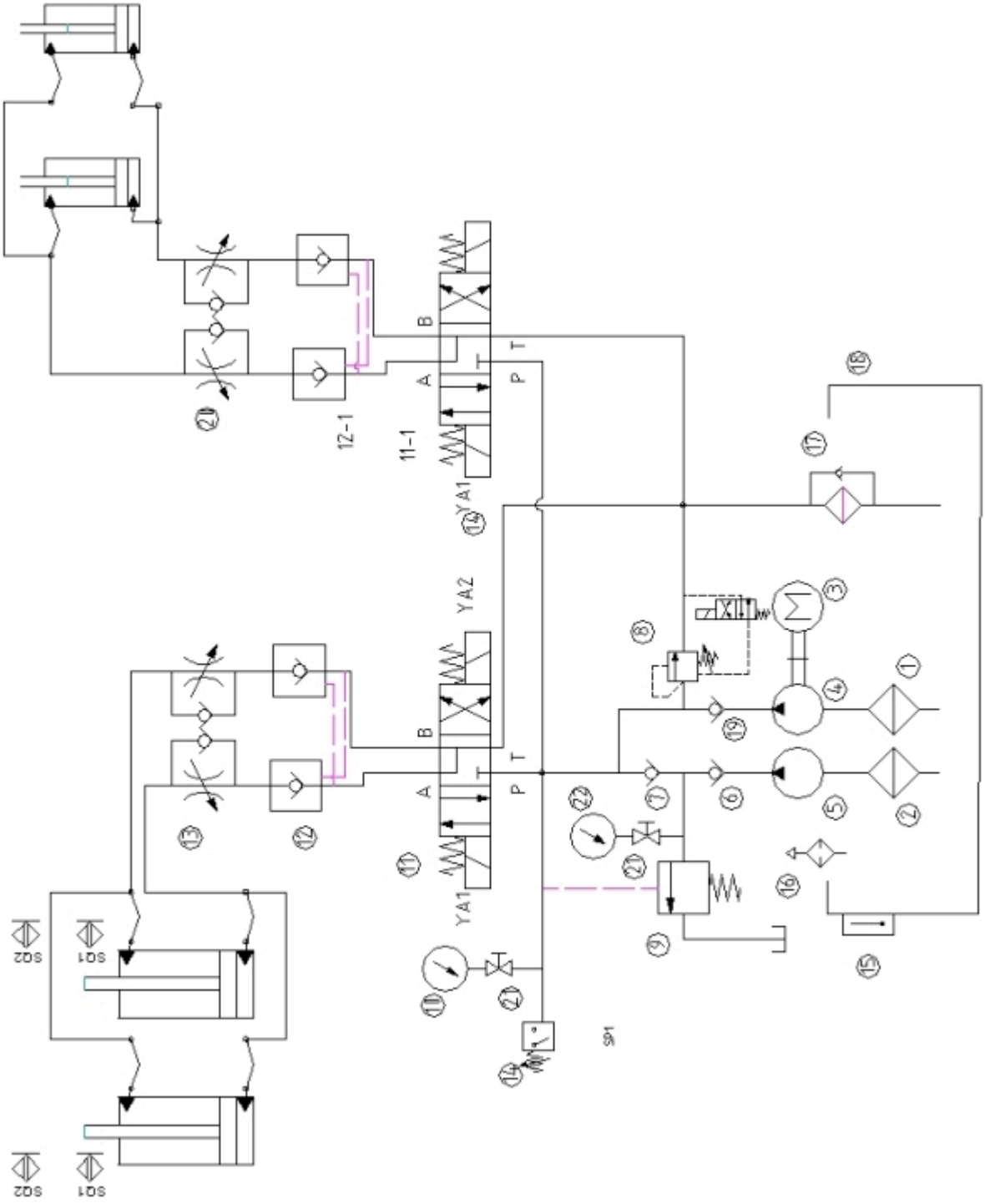


Models 1200-2000 Hydraulic Unit

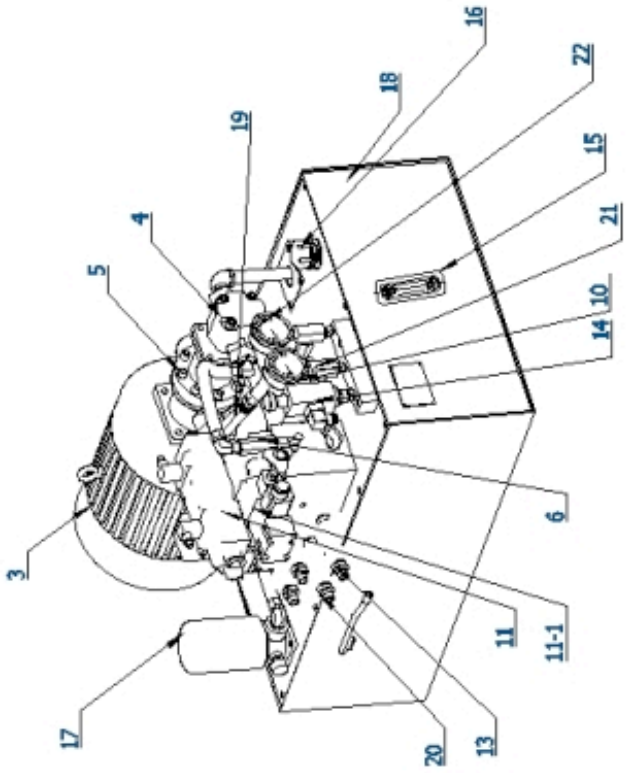


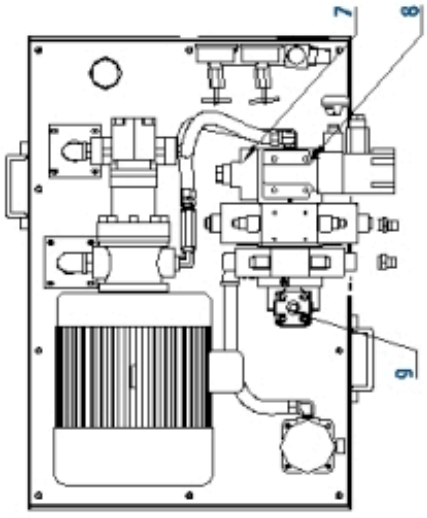


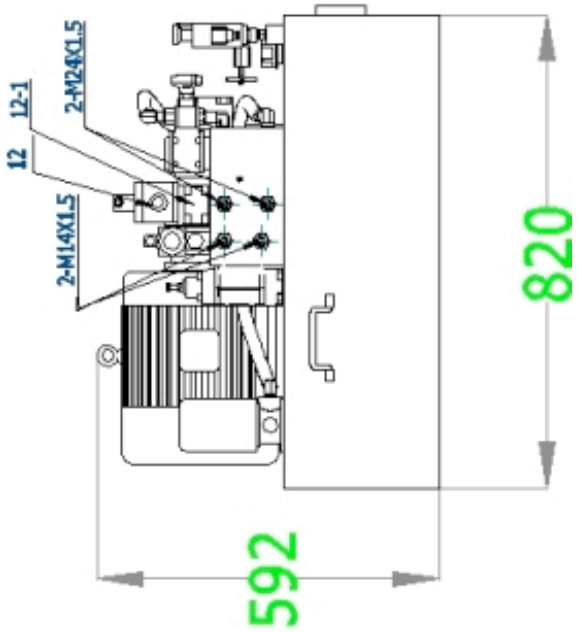
Models 1200-2000 Hydraulic Screen Diagram



Models 1200-2000 Hydraulic Unit







A-3 Spare Parts List

Model 850

Pos.	Pc	Description/Standard
100		**Machine complete**
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		**Screen complete (Standard)**
201	1	Screen
202	5	Screen support screws DIN912-M12x35-8.8
203	5	Washer DIN125-B-13-140HV
204	5	Spring washer DIN127-A -13
205	2	Clamp
206	2	Clamp mounting screws DIN933-M20x40-8.8
207	2	Washer DIN125-A 20-140HV
208	2	Spring washer DIN127-A20
200		**Screen complete (Hydraulic)**
201	1	Screen
202	5	Screen support screws DIN912-M12x35-8.8
203	5	Washer DIN125-B-13-140HV
204	5	Spring washer DIN127-A-13
205	1	Screen support
206	2	Cylinder for screen support opening Ø50xØ25x145
300	2	**Bearing**
301	2	Bearing housing SN320/16Mn
302	2	Bearing GB/T288-94/22320
303	2	Bearing Cover A
304	1	Bearing Cover B
305	1	Bearing housing cover plate
306	3	Sealing GB9877.1-86 J115x140x12
307	2	Grease nipple GB1152-89/M8x1
308	1	Sleeve Ø150x16
309	24	Mounting screw cover plate DIN912-M10x40-8.8
	8	Mounting screw cover plate DIN912-M10x45-8.8
310	1	Bearing mounting plate
311	2	Mounting plate screw DIN912 – M24x50 – 8.8
312	2	Washer DIN 125 – A 24
400		**Drive**
401	1	Motor 37 kW/460V/60Hz
		Motor 55 kW/460V/60HZ
402	1	Gear pulley SPB280-4
		Gear pulley SPC300-4
403	1	Gear pulley taper bushing TB 3020-48
		Gear pulley taper bushing TB 3535-50
404	1	Key C 28x250

405	4	V-Belt SPB 2150
		V-Belt SPC 2430
406	1	Motor pulley SPB 224-4
		Motor pulley SPC 250-4
407	1	Motor pulley taper bushing TB 3020-60
		Motor pulley taper bushing TB 3535-65
408	1	Key Motor shaft
409	1	Pulley cover
410	1	Motor plate
411	1	Gear box SEW MC2PLHT02 i=20
412	1	Torque arm plate
413	1	Rubber bushing plate
414	1	Rubber bushing
415	1	Copper bushing
416	1	Torque arm screw
417	1	Cover plate
500	1	**E-knife rotor ø387x850**
501	60	Rotor knife 34x34x20
502	60	Rotor knife mounting Screw DIN912 – M12x40 – 12.9
503	60	Washer GB/T1230-13
504	60	Rotor knife holder
505	120	Knife holder mounting screw DIN912 – M8x25– 12.9
600	2	**Bed knife complete**
601	6	Bed knife 279x80x30
602	12	Mounting Screw DIN912 – M12x55 – 12.9
603	6	Lower bed knife adjusting screw for pushing DIN912 – M16x35 – 12.9
604	6	Upper bed knife adjusting screw for pushing DIN912 – M16x45 – 12.9
605	12	Bed knife adjusting screw for pulling DIN912 – M16x50 – 12.9
606	1	Bed knife cover plate
	1	Bed knife cover plate left
	1	Bed knife cover plate right
607	12	Cover plate mounting screw DIN912–M12x35– 12.9
700	1	**Ram complete**
701	2	Arm for ram
702	2	Bearing for arm UCFC212
703	8	Mounting screw for bearing DIN912-M16x50-12.9
704	2	Screw for arm
705	1	Ram
706	12	Mounting screws ram arm DIN912-M16x80-12.9
707	12	Nut DIN982 – M16 – 10
708	12	Washer DIN 433-16-300HV
709	12	Spring washer DIN127-A-16
710	12	Mounting pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper YI GB1356-78 n=12/d=2/D=12/H=60
713	1	Cover plate for scraper
714	2	Upper cylinder screw
715	2	Lower screw for cylinder mounting

716	8	Mounting screw for cylinder screw DIN912 – M16x25 – 12.9
717	4	Grease nipple GB1152/M10x1
800		**Hydraulic**
801	2	Cylinder for ram ø35xø70x420
802		Piping
803		Connectors
804	1	Hydraulic unit 3.75kW
805	1	Set of sealing for cylinders
806	1	Oil filter 12AT-10-CR
900		**Electrical parts**
901	2	Safety switch AZ15ZVRK-1476-1
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for proximity switch EI0200

Model 1200

Pos.	Pc	Description/Standard
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		**Screen complete (Standard)**
201	1	Screen
202	5	Screen support screw DIN912–M12x35–8.8
203	5	Washer DIN125-B-13-140HV
204	5	Spring washer DIN127-A-13
205	2	Clamp
206	2	Clamp mounting screws DIN933 – M20 – 8.8
207	2	Washer DIN125-A – 20 – 140HV
208	2	Spring washer DIN127-A-20
200	1	**Screen complete (Hydraulic)**
201	1	Screen
202	5	Screen support screws DIN912-M12x35-8.8
203	5	Washer DIN125-B-13-140HV
204	5	Spring washer DIN127-A-13
205	1	Screen support
206	2	Cylinder for screen support opening Ø50xØ25x145
300	2	**Bearing**
301	2	Bearing housing SN324
302	2	Bearing GB/T288-94-22324
303	2	Bearing Cover A
304	1	Bearing Cover B
305	1	Bearing housing cover plate
306	3	Sealing GB9877.1-86 J150x180x15
307	2	Grease nipple GB1152-89/M8x1
308	2	Sleeve Ø150x16
309	24	Mounting screw cover plate DIN912-M10x40-8.8
	8	Mounting screw cover plate DIN912-M10x45-8.8
310	1	Bearing mounting plate
311	1	Mounting plate screw DIN912 – M24x50 – 8.8
312	1	Washer DIN125 - A - 24
400		**Drive**
401	1	Motor 55 kW 460V/60Hz
		Motor 75KW 460V/60Hz
402	1	Gear pulley SPC300-4
		Gear pulley SPC375-4
403	1	Gear pulley taper bushing TB 3535-50

		Gear pulley taper bushing TB 3535-55
404	1	Key C28x250
405	5	V-Belt SPC 2430
		V-Belt SPC 2550
406	1	Motor pulley SPC 250-4
		Motor pulley SPC 300-4
407	1	Motor pulley taper bushing TB 3535-65
		Motor pulley taper bushing TB 3535-75
408	1	Key Motor shaft
409	1	Pulley cover
410	1	Motor plate
411	1	Gear box SEW MC2PLHT03 i=20
412	1	Torque arm plate 55KW
413	1	Rubber bushing plate
414	1	Rubber bushing 116x68x100
415	1	Copper bushing 68x63x100
416	1	Torque arm screw
417	1	Cover plate
500	1	**E-knife rotor ø457x1130**
501	81	Rotor knife 34x34x20
502	81	Rotor knife mounting Screw DIN912 – M12x40 – 12.9
503	81	Washer GB/T1230-13
504	81	Rotor knife holder
505	162	Knife holder mounting screw DIN912 – M8x25 – 12.9
600	2	**Bed knife complete**
601	8	Bed knife 279x80x30
602	16	Mounting Screw DIN912 – M12x55 – 12.9
603	8	Lower bed knife adjusting screw for pushing DIN912 – M16x35 – 12.9
604	8	Upper bed knife adjusting screw for pushing DIN912 – M16x45 – 12.9
605	16	Bed knife adjusting screw for pulling DIN912 – M16x60 – 12.9
606	2	Bed knife cover plate
	1	Bed knife cover plate left
	1	Bed knife cover plate right
607	16	Cover plate mounting screw DIN912 – M12x35 – 12.9
700	1	**Ram complete**
701	2	Arm for ram
702	2	Bearing for arm UCFC212
703	8	Mounting screw for bearing DIN912-M16x70-12.9
704	2	Screw for arm
705	1	Ram
706	12	Mounting screws ram arm DIN912-M16x90-12.9
707	12	Nut DIN934-M16-10
708	12	Washer DIN 433-16-300HV
709	12	Spring washer DIN127-A-16
710	12	Mounting pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper YI GB1356-78 n=14/d=2/D=12/H=50

713	1	Cover plate for scraper
714	2	Upper cylinder screw
715	2	Lower screw for cylinder mounting
716	8	Mounting screw for cylinder screw DIN912 – M16x25 – 12.9
717	4	Grease nipple GB1152-M10x1
800		**Hydraulic**
801	2	Cylinder for ram ø40xø80x470
802		Piping
803		Connectors
804	1	Hydraulic unit 5.6kW
805	1	Set of sealing for cylinders
806	1	Oil filter 12AT-10-CR
900		**Electrical parts**
901	2	Safety switch AZ15ZVRK-1476-1
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for proximity switch EI0200

Model 1500

Pos.	Pc	Description/Standard
100		**Machine complete**
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		**Screen complete (Standard)**
201	1	Screen 12/16/20/25
202	6	Screen support screw DIN912–M12x35–8.8
203	6	Washer DIN125-B-13-140HV
204	6	Spring washer DIN127-A-13
205	2	Clamp
206	2	Clamp mounting screws DIN933 – M20 – 8.8
207	2	Washer DIN125-A – 20 – 140HV
208	2	Spring washer DIN127-A-20
200		**Screen complete (Hydraulic)**
201	1	Screen
202	6	Screen support screws DIN912-M12x35-8.8
203	6	Washer DIN125-B-13-140HV
203	6	Spring washer DIN127-A-13
204	1	Screen support
205	2	Cylinder for screen support opening Ø50xØ25x145
300		**Bearing**
301	2	Bearing housing SN324/16Mn
302	2	Bearing GB/T288-94/22324
303	2	Bearing Cover A
304	1	Bearing Cover B
305	1	Bearing housing cover plate
306	3	Sealing GB9877.1-86 J150x180x15
307	2	Grease nipple GB1152-89/M8x1
308	2	Sleeve Ø150x16
309	24	Mounting screw cover plate DIN912-M10x40-8.8
	8	Mounting screw cover plate DIN912-M10x45-8.8
310	1	Bearing mounting plate
311	1	Mounting plate screw DIN912 – M24x50 – 8.8
312	1	Washer DIN125 - A – 24
400		**Drive**
401	1	Motor 75 kW 460V 60HZ
402	1	Gear pulley SPC375-4
403	1	Gear pulley taper bushing TB 3535-55
404	1	Key C28x250
405	4	V-Belt SPC2550
406	1	Motor pulley SPC 300-4

407	1	Motor pulley taper bushing TB 3535-75
408	1	Key Motor shaft
409	1	Pulley cover
410	1	Motor plate
411	1	Gear box SEW MC2PLHT04 i=20
412	1	Torque arm plate 75 KW
413	1	Rubber bushing plate
414	1	Rubber bushing 116x68x100
415	1	Copper bushing 68x63x100
416	1	Torque arm screw
417	1	Cover plate
418	1	Cover 75KW
419	6	Rubber bushing plate screws DIN933-M16x50-12.9
420	6	Washer DIN433-16
421	6	Spring washer DIN127-A-16
422	6	Nut DIN934-M16-10
423	1	Torque arm complete 75KW
500	1	**E-knife rotor ø457x1410**
501	102	Rotor knife 34x34x20
502	102	Rotor knife mounting Screw DIN912 – M12x40 – 12.9
503	102	Washer GB/T1230-13
504	102	Rotor knife holder
505	204	Knife holder mounting screw DIN912 – M8x25 – 12.9
600	2	**Bed knife complete**
601	10	Bed knife 279x80x30/Cr12Mo1V1
602	20	Mounting Screw DIN912 – M12x55 – 12.9
603	10	Lower bed knife adjusting screw for pushing DIN912 – M16x35 – 12.9
604	10	Upper bed knife adjusting screw for pushing DIN912 – M16x45 – 12.9
605	20	Bed knife adjusting screw for pulling DIN912 – M16x60 – 12.9
606	1	Bed knife cover plate (right)
	1	Bed knife cover plate(left)
	3	Bed knife cover plate
607	20	Cover plate mounting screw DIN912 – M12x35 – 12.9
700	1	**Ram complete**
701	2	Arm for ram
702	2	Bearing for arm UCF212-1
703	8	Mounting screw for bearing DIN912-M16x70-12.9
704	2	Screw for arm
705	1	Ram
706	12	Mounting screws ram arm DIN912-M16x90-12.9
707	12	Nut DIN934-M16-10
708	12	Washer DIN 433-16-300HV
709	12	Spring washer DIN127-A-16
710	12	Mounting pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper YI GB1356-78 n=14/d=2/D=12/H=50

713	1	Cover plate for scraper
714	2	Upper cylinder screw
715	2	Lower screw for cylinder mounting
716	8	Mounting screw for cylinder screw DIN912 – M16x25 – 12.9
717	4	Grease nipple GB1152-M10x1
800		**Hydraulic**
801	2	Cylinder for ram ø50xø100x470
802		Piping
803		Connectors
804	1	Hydraulic unit 5.6kW
805	1	Set of sealing for cylinder
806	1	Oil filter 12AT-10-CR
900		**Electrical parts**
901	2	Safety switch AZ15ZVRK-1476-1
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for proximity switch EI0200

Model 2000

Pos.	Pc	Description/Standard
100		**Machine complete**
101	1	Standard hopper
102	2	PP-scraper side
103	1	PP-scraper top
104	1	Upper door
105	1	Lower door
106	2	Safety grid side
107	1	Safety grid back
108	1	Safety grid back
109	1	Ram residual chute
200		**Screen complete (Hydraulic)**
201	1	Screen 12/16/20/25
202	8	Screen support screws DIN912-M12x35-8.8
203	8	Washer DIN125-B-13-140HV
204	8	Spring washer DIN127-A-13
205	1	Screen support
206	2	Cylinder for screen support opening Ø50xØ25x145
300		**Bearing**
301	2	Bearing housing SN324/16Mn
302	2	Bearing GB/T288-94/22324
303	1	Bearing Cover A
304	3	Bearing Cover B
305	0	
306	4	Sealing GB9877.1-86 J150x180x15
307	2	Grease nipple GB1152-89/M8x1
308	2	Sleeve Ø150x16
309	32	Mounting screw cover plate DIN912-M10x40-8.8
310	2	Bearing mounting plate
311	4	Mounting plate screw DIN912 – M12x70 – 12.9
400		**Drive**
401	1	Motor 55 kW 460V/60HZ (right)
	1	Motor 55 kW 460V/60HZ (left)
	1	Motor 75 kW 460V/60HZ (right)
	1	Motor 75 kW 460V/60HZ (left)
402	2	Gear pulley SPC300-4
403	2	Gear pulley taper bushing TB 3535-50
		Gear pulley taper bushing TB 3535-55
404	2	Key C25x210
405	8	V-Belt SPC 2430
		V-Belt SPC 2550
406	2	Motor pulley SPC 250-4
		Motor pulley SPC 300-4
407	2	Motor pulley taper bushing 3535-65
		Motor pulley taper bushing 3535-75
408	2	Key Motor shaft
409	2	Pulley cover
410	2	Motor plate
411	2	Gear box MC2PLHT03 i=20
412	2	Torque arm plate 55KW

413	2	Rubber bushing plate
414	2	Rubber bushing 116x68x100
415	2	Copper bushing 68x63x100
416	2	Torque arm screw
417	2	Cover plate
418	2	Cover 55KW
419	12	Rubber bushing plate screws DIN933-M16x50-12.9
420	12	Washer DIN433-16
421	12	Spring washer DIN127-A-16
422	12	Nut DIN934-M16-10
423	2	Torque arm complete SEW
500	1	**E-knife rotor ø457x1950**
501	144	Rotor knife 34x34x20
502	144	Rotor knife mounting Screw DIN912 – M12x40 – 12.9
503	144	Washer GB/T1230-13
504	144	Rotor knife holder
505	288	Knife holder mounting screw DIN912 – M8x25 – 12.9
600	2	**Bed knife complete**
601	14	Bed knife 279x80x30 /Cr12Mo1V1
602	28	Mounting Screw DIN912 – M12x55 – 12.9
603	14	Lower bed knife adjusting screw for pushing DIN912 – M16x35 – 12.9
604	14	Upper bed knife adjusting screw for pushing DIN912 – M16x45 – 12.9
605	28	Bed knife adjusting screw for pulling DIN912 – M16x60 – 12.9
606	1	Bed knife cover plate (right)
	1	Bed knife cover plate(left)
	5	Bed knife cover plate
607	28	Cover plate mounting screw DIN912 – M12x35 – 12.9
700	1	**Ram complete**
701	2	Arm for ram
702	2	Bearing for arm UCFC212
703	8	Mounting screw for bearing DIN912-M16x70-12.9
704	2	Screw for arm
705	1	Ram
706	12	Mounting screws ram arm DIN912-M16x90-12.9
707	12	Nut DIN934-M16-10
708	12	Washer DIN 433-16-300HV
709	12	Spring washer DIN127-A-16
710	12	Mounting pin DIN94-2.5x32
711	1	Scraper
712	4	Spring for scraper YI GB1356-78 n=14/d=2/D=12/H=50
713	1	Cover plate for scraper
714	2	Upper cylinder screw
715	2	Lower screw for cylinder mounting
716	8	Mounting screw for cylinder screw DIN912 – M16x25 – 12.9
717	4	Grease nipple GB1152-M10x1

800		**Hydraulic**
801	2	Cylinder for ram ø50xø100x470
802		Piping
803		Connectors
804	1	Hydraulic unit 5.6kW
805	1	Set of sealing for cylinder
806	1	Oil filter 12AT-10-CR
900		**Electrical parts**
901	2	Safety switch AZ15ZVRK-1476-1
902	1	Small control box
903	1	Control panel
904	2	Proximity switch II0297
905	2	Cable for proximity switch EI0200

Model 850 Hydraulic Unit Spare Parts

Pos	Description	Standard	Pc	Supplier
1	Oil filter net	MF-06	1	CLC
2	Oil filter net	MF-08	1	CLC
3	Electric motor	5HPX4P(straight system)380V	1	Qunce
4	Wheel pump	HGP-2A-F6R	1	Xinhong
5	Vane pump	50T-19	1	
6	Check valve	CIT-03, CIT-04	2	CLC
7	Check valve	CRG-03	1	7Ocean
8	Spillover valve	BG-03	1	7Ocean
9	Sequence valve	HG-03	1	7Ocean
10	Pressure Gauge	LA-150(including connector)	1	FTB
11	Solenoid valve	DSD-G03-0C-DC24	1	7Ocean
12	Pilot operated check valve	MPD-03-W-5	1	7Ocean
13	Throttle check valve	PT-04	2	7Ocean
14	Pressure relay	PS-02-2-10	1	7Ocean
15	Oil gauge	LS-3	1	CLC
16	Oil lubricator	AB-1162	1	CLC
17	Scavenge oil filter	70134-10C-R	1	
18	Oil box	100L	1	7Ocean

Model 850 Hydraulic Screen Spare Parts

Pos	Description	Standard	Pc	Supplier
1	Oil filter net	MF-06	1	CLC
2	Oil filter net	MF-08	1	CLC
3	Electric motor	5HPX4P(straight system) 380V	1	Qunce
4	Wheel pump	HGP-2A-F6R	1	Xinhong
5	Vane pump	50T-19	1	
6	Check valve	CIT-03, CIT-04	2	CLC
7	Check valve	CRG-03	1	7Ocean
8	Spillover valve	BSG-03-INP-2	1	7Ocean
9	Sequence valve	HG-03-B	1	7Ocean
10	Pressure Gauge	LA-250(including connector)	1	FTB
11	Solenoid valve	DSD-GO3-6C-DC24	1	7Ocean
12	Pilot operated check valve	MPD-03-W-2	1	7Ocean
13	Throttle check valve	PT-04	2	7Ocean
14	Pressure relay	PS-02-2-10	1	7Ocean
15	Oil gauge	LS-3	1	CLC
16	Oil lubricator	AB-1162	1	CLC
17	Scavenge oil filter	70134-10C-R	1	
18	Oil box	100L	1	7Ocean
19	Solenoid valve	DSD-G02-2C-DC24	1	7Ocean
20	Throttle check valve	PT-03	2	7Ocean

Model 1200-2000 Hydraulic Unit Spare Parts

Pos	Description	Standard	Pc	Supplier
1	Oil filter net	MF-06	1	CLC
2	Oil filter net	MF-08	1	CLC
3	Electric motor	7.5HPX4P(straight system)	1	Qunce
4	Wheel pump	HGP-2A-F9R	1	Xinhong
5	Vane pump	50T-26	1	Kaijia
6	Check valve	CIT-03, CIT-04	2	CLC
7	Check valve	CRG-03-1-10	1	7Ocean
8	Spillover valve	BG-03-3-10	1	7Ocean
9	Sequence valve	HG-03-1-10(70kgf)	1	7Ocean
10	Pressure Gauge	LA-250kgf(including connector)	1	FTB
11	Solenoid valve	DSD-G03-8C-DC24-31	1	7Ocean
12	Pilot operated check valve	MPC-03-W-1-10	1	7Ocean
13	Throttle check valve	PT-04	2	7Ocean
14	Pressure relay	PS-02-3-10	1	7Ocean
15	Oil gauge	LS-3	1	CLC
16	Oil lubricator	AB-1162	1	CLC
17	Scavenge oil filter	12AT-10-CR	1	
18	Oil box	75L	1	7Ocean

Model 1200-2000 Hydraulic Screen Spare Parts

Pos	Description	Standard	Pc	Supplier
1	Oil filter net	MF-06	1	CLC
2	Oil filter net	MF-08	1	CLC
3	Electric motor	7.5HPX4P(straight system)	1	Qunce
4	Wheel pump	HGP-2A-F9R	1	Xinhong
5	Vane pump	50T-26	1	Kaijia
6	Check valve	CIT-03	1	Huatian
7	Check valve	CRG-03-1-10	1	7Ocean
8	Magnetic Spillover valve	BSG-03-INP-3-30	1	7Ocean
9	Sequence valve	HG-03-B-4(70kg)	1	7Ocean
10	Pressure Gauge	LA-250(including connector)	1	FTB
11	Solenoid valve	DSD-G03-6C-***-31	1	7Ocean
11-1	Solenoid valve	DSD-G02-6C-***-31	1	7Ocean
12	Pilot operated check valve	MPD-03-W-1-10	1	7Ocean
12-1	Pilot operated check valve	MPD-02-W-1-10	1	7Ocean
13	Throttle check valve	PT-04	2	7Ocean
14	Pressure relay	PS-02-3-10	1	7Ocean
15	Oil gauge	LS-3	1	Huatian
16	Oil lubricator	AB-1162	1	Huatian
17	Scavenge oil filter	70134-10C-R	1	7Ocean
18	Oil box	90L	1	7Ocean
19	Check valve	CIT-04	1	CLC
20	Throttle check valve	PT-03	2	7Ocean
21	Pressure gauge switch	GCT-02	2	Huatian
22	Pressure Gauge	LA-100(including connector)	1	FTB

A-4 Technical Assistance

Parts and Service Department

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

For immediate assistance, please contact:

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  North America email: acsuscanadacustserv@corpemail.com

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